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Contributions.

A Bridge Test by Artillery.

To the Editor of the Railroad Gazette:

In a memoir of the late Albert Fink, prepared for the American Society of Civil Engineers, is the following note:

"In 1860 Mr. Fink was considered the leading bridge engineer of the United States. When in 1865 the North Missouri Railroad invited designs for the first bridge to be erected over the Missouri River, the plans of Mr. Fink received the second prize. He had in the meantime designed, besides many other structures, the great iron bridge across the Ohio River at Louisville, which was begun in 1867 and completed in 1870."

There is a reminiscence connected with this fact which illustrates how little was known on the art of bridge building by very well informed men, even as late as 1865.

The North Missouri Railroad appointed a commission to award the premiums. This consisted of two engineer officers, General W. T. Sherman, General John Pope, and of a civilian, Thomas C. Fletcher, Governor of Missouri. These gentlemen were greatly puzzled how to decide on the merits of the 15 or more designs submitted, and consumed a week in discussions. The award was finally put at rest by General Sherman, who stated that when disabling Confederate railroads he had several times occasion to destroy bridges. This he did with artillery, and he remembered distinctly that upon coming to a Fink bridge the very first cannon-ball struck the center post (cast-iron) and the bridge tumbled down into ruin, while many shots had been fired at Bollman bridges, striking the ties and lower chords without bringing them down. The first prize was therefore awarded to the Bollman bridge, thus making, for that occasion, cannon-balls the measure of the merits of bridges.

O. CHANUTE.

Rail Creeping.

To the Editor of the Railroad Gazette:

Rail creeping is a comparatively modern disease, which the doctors of track have only lately begun to diagnose. In past years it was not so troublesome as at present. Now switches and signals are often prevented from working by the creeping of the rails; sometimes great stretches of track have to be loosened up and readjusted.

Several causes have been assigned to account for this troublesome phenomenon, as undulation of the rail, the friction of the wheels upon the rails, and expansion and contraction due to changes of temperature. Heavy rolling stock increases friction and undulation; high speeds give heavier blows to the rails in a longitudinal direction, and the general application of power-brakes to freight as well as passenger trains, increases creeping; and the creeping is greatest in the direction of the traffic, and down heavy grades; while it is less on a single than on double track roads. Some of the chief causes are of comparatively modern origin, and explain why rail-creeping was not so troublesome in past times.

If it were not for expansion and contraction, rails could be permanently secured at a sufficient number of points to the ties by angle brackets, bolted to the web of the rails, and spiked to the ties. The expansion and contraction of the rails, however, would destroy any fastenings of this kind.

This expansion and contraction loosens the hold between ties and rails. Rails being laid so as to have a longitudinal movement in the splices, they push against each other. If rails are light and flexible in proportion to the weight of the rolling stock, the undulating motion greatly accelerates creeping.

There are two ways to prevent creeping. One is, while allowing rails to move in the splices, to spike those splices fast to the ties, but this method has not been found effective. The other method is that devised by Mr. Bonzano, as illustrated in the Railroad Gazette of Oct. 21st, and in the Engineering News of Oct. 20th. This device holds the rail fast to the ties at the middle of its length and allows it to expand and contract freely to and from each end.

The advantage of this method is that in this way the rails expanding and contracting from temperature are held at the middle to their original places; while by the first method they cannot be so held, and hence they crowd upon one another, and the pressure becomes cumulative and irresistable. If each individual rail is held fast at its center to the roadbed, the force tending to make it creep is not transmitted from one rail to another, and hence it is possible to hold it.

The creeping device is attached to the neutral axis of the rail at the center of the web, which is the only place where it is safe to make a hole in a steel rail. It must be proportioned strong enough with its fastenings to resist the thrust caused by the various forces, minus the friction of the rail upon ties and on spikes. When the rail expands, it does so in both directions, and one force neutralizes the other. Hence if the fastening in the center is strong enough to hold the rail against wheel friction and undulation, minus the friction of each rail on ties and on the spikes, it will also prevent any movement at the middle of the rail from expansion and contraction, and if the middle of the rail is held fast the rail cannot leave its position.

T. C. CLARKE, M. Am. Soc. C. E.

Specifications vs. the Reliable Manufacturer.

Kansas City, Mo., Nov. 21, 1898.

To the Editor of the Railroad Gazette:

I notice your editorial under caption of "Specifications vs. the Reliable Manufacturer." I have no desire for notoriety, nevertheless I feel that it is proper to call attention to the fact that improper deductions were made from my letter to you of August 12, before the New York Railroad Club, in their meeting Oct. 20, and upon which your editorial is predicated. From the paper of the evening I quote as follows:

"It strikes me that there are two objections to this latter course; one is that *the buyer loses the advantages in the way of price that come from competition if he confines his purchase to one or two makers* and the other is that even if the head of the firm is entirely honest and anxious to give the consumer the best he can produce, those under him are not always so interested to do this and may ship goods which happen to be below the standard, if they know there are to be no tests made."

(The italics are mine.)

There is nothing in my communication of Aug. 12 to justify any such deductions as to confining purchases "to one or two makers," in that the closing of the first paragraph of the letter in question clearly indicates that under the plan suggested purchases are made only upon quotations received—"from reputable manufacturers, and of which I have generally found several anxious for business, and give the orders to those who offered to supply our requirements at the best figures." The "best figures" do not necessarily mean the lowest figures; values are never determined from one component part.

For twelve years I wore out shoe leather, good clothes and smiles in an endeavor to sell goods, and during that period I came largely in contact with the railroad trade, as well as with a large jobbing business, and with more or less of individual patronage. I am somewhat familiar with the matter of purchases made by some of the largest jobbers and manufacturers in the United States, and I believe it will be found upon investigation that these merchants consume a very small portion of their "substance" in so-called specifications, and that it will also be found that these jobbing houses patronize that class of manufacturers who value their reputation just a little bit more than they do a "round dollar."

When the time comes that railroad officials and employees, from the least to the greatest, realize the fact that on railroads, as in manufacturing and jobbing institutions, there is but one department in the whole organization—namely, the right hand side of profit and loss account—just that much earlier will railroad stocks have an increased value. A purchasing agent should never refer to, or think of, his office as a department. He is the officer of the entire organization, and is just as much a part of the maintenance of way department as of the transportation department, of the motive power department, or of any other department, and a purchasing agent who is not in close touch with not only the heads of all departments, but as far as possible with the entire organization, cannot produce the result which should be had.

Specifications have their value, but hobbies are expensive. Just as serious a mistake will result from always buying the highest priced articles as will follow always purchasing that which can be had at the lowest price. The only intelligent basis of buying is from the standpoint of the best value for one dollar, and to obtain this result it is not necessary to adopt some system involving the unnecessary and unwarranted expense that attaches to the average system of specifications.

I recently met a manufcturer of air hose, who referred to my communication of Aug. 12, and conscientiously, of course, pointed out to me the "errors of my ways." During the twelve years that I was "on the other side of the fence," I took several orders for hose, rubber belt, etc., that would have made glad the heart of any salesman, and in the period mentioned I have had it conclusively developed that rubber goods do not necessarily have to be put into service in order to lose their vitality. In other words, you can take a piece of first class hose and hang it on a peg and wear it out, so far as its usefulness is concerned, without ever "dragging it over a station platform."

A purchaser must give points of this nature their due consideration, and be so in touch with the different departments that he is regularly advised with regard to the commercial value (this means utility) of the different articles he is purchasing, and no purchasing agent can secure to his company the best results where he is practically confined to certain specified makes of articles in his purchases. To get results, the field must be open to him, and with this the purchasing agent must combine the quality expressed in the Scripture: "Be ye wise as a serpent and harmless as a dove."

Touching upon the closing remarks in your editorial, I want to say that I earnestly hope for the day when all men will be good, and this will be earliest accomplished by each person attending to his own crop of seed sowing.

IRA C. HUBBEL.

The Evolution of the Locomotive Engine.*

By William P. Marshall, M. Inst. C. E.

The object of this paper is to adjust discrepancies and omissions in the accounts of the early locomotives, while there are those living who can supply the required information; as well as to preserve a record of the leading steps in the evolution of the present locomotive, with a notice of further steps now in process of trial.

1812.—The locomotive engine dates practically from Blenkinsop's engine in 1812 on the Middleton Colliery Tramway, Leeds, which was the first commercially successful locomotive, and worked continuously for nearly 50 years over the line of 3½ miles length from Middleton Colliery to Leeds. This engine, Fig. 1, was designed and made by Matthew Murray, of Leeds, for Mr. Blenkinsop, the proprietor of Middleton Colliery. It had a cylindrical boiler, 10 ft. long and 4 ft. in diameter, with a single straight flue containing the fire-grate; two 8-in. vertical cylinders were fixed in the top of the boiler, sunk two-thirds within the boiler, with cross-head guides and connecting-rods coupled to spur-wheels, gearing into a single driving cog-wheel on one side of the engine, the cranks being at right angles. The driving cog-wheel worked into the Blenkinsop rack-rail, which had hollow cogs, 6 in. apart, cast upon the outer face of one rail, leaving the top of the rail plane for the tread of the wheel.

1813.—"Puffing Billy," on the Wylam Colliery line, Fig. 2, was the next locomotive; it was designed by William Hedley, colliery viewer for Mr. Blackett, the proprietor of Wylam Colliery, nine miles west from Newcastle, and it was the first successful locomotive that worked with smooth wheels on smooth rails.

This engine worked continuously for 50 years over a length of 5 miles from the colliery to Lemington, a shipping staithe on the River Tyne; and was afterwards removed to the South Kensington Museum, where it is now preserved.

The only locomotive previously working was Blenkinsop's engine, driving by a cog-wheel with a rack-rail; but Hedley determined to try the experiment whether an engine with smooth driving-wheels could draw a train of loaded wagons. He fitted up a four-wheeled truck with the wheels driven by cog-wheels, and winch handles worked by men upon the truck; this was loaded with a definite weight of iron, and set to draw loaded coal-wagons on the railway, which were increased in number until the driving-wheels began to slip. The experiment was decisive, that the friction of the smooth wheels of an engine upon the rails was sufficient to enable an engine to draw a train of loaded wagons.

"Puffing Billy" had a cylindrical boiler, 9 ft. in length and 4 ft. 1 in. in diameter, with a U-shaped return-flue, having the fire-grate and chimney at the same end of the boiler; two 8-in. cylinders were fixed at the sides of the boiler at the other end of the engine, and connected to "grasshopper" beams with parallel motions. A detached axle in the center of the engine, with a crank at each end, was driven by connecting-rods from the two beams, and had a cog-wheel that was geared by intermediate wheels to a wheel fixed on each of the engine axles, doubling the speed.

An interesting point is that the cylinders were steam-jacketed, being each enclosed in a cylindrical pocket that projected from the side of the boiler barrel—as now seen in the South Kensington Museum. The Blenkinsop and Killingworth engines (1812 and 1815) had their cylinders also partly steam-jacketed by being sunk into the boiler.

1815.—The Killingworth engine (Fig. 3), the first of George Stephenson's engines, was made for Lord Ravensworth and partners, the proprietors of the Killingworth Colliery, seven miles north of Newcastle, and it worked continuously for more than 40 years

* From a paper presented before the Institution of Civil Engineers, London.

over the four miles of railway from the colliery to Wilmington Quay on the River Tyne. This was the first locomotive driven direct by cranks on the carrying wheels; it had a cylindrical boiler 9 ft. 10 in. in length and 4 feet in diameter, with a single straight flue, and two vertical 9-in. cylinders half sunk in the top of the boiler; the cross-heads had vertical guides, and were connected direct to cranks upon the two pairs of wheels. These wheels were at first coupled by an endless chain upon pulleys fixed on the two axles; but after a few years' working outside coupling-rods were adopted, and these have been adhered to ever since. The boiler of this engine—and of the subsequent Killingworth engines—was, since the "Rocket," made partially tubular by removing half the length of the internal flue and substituting small tubes; the first engine, "Billy No. 1," as thus altered, is now preserved upon a pedestal in Newcastle station.

1822.—The Hetton Colliery engines by Stephenson, that began working in 1822, were similar to the Killingworth engines, but with 10-in. cylinders; and they worked a length of eight miles of railway from Hetton Colliery to Sunderland.

1825.—The Stockton & Darlington Railway, 20 miles length, was opened in 1825 with Stephenson's engines, Fig. 4, similar to the Killingworth engines, but with 10-in. cylinders, and having beams with parallel motions instead of cross-head guides. The fire-bars, like the previous engines, were carried upon bearers laid across the flue, and a 9-in. brick fire-bridge was built in the flue at the end of the grate. The first of these engines, which worked for 20 years, is now preserved upon a pedestal in Darlington station.

1829.—The "Sanspareil" (Fig. 5) was made for the Liverpool and Manchester competition trial in 1829, by Hackworth, Locomotive Superintendent of the Stockton & Darlington Railway; it was smaller than the Darlington engines, the weight being limited in the trial to 4½ tons for a four-wheeled engine. It had a cylindrical boiler, 6 ft. long and 4 ft. 4 in. in diameter, with a U-shaped return-flue, having the fire-grate projecting 3 ft. beyond the end of the boiler, with a semi-circular water casing over the top and sides, leaving the fire-grate open below; the return-flue was also extended 2 ft. beyond the boiler before joining the chimney, and had a water space all round the projecting portion. Two vertical 7-in. cylinders were fixed above the boiler, with connecting-rods working directly down to cranks on the trailing wheels, which were coupled by side-rods to the leading wheels. This engine is preserved in the South Kensington Museum; but the water casing over the fire-grate has been altered at some time by shortening it and making it completely cylindrical. In the competition trial the Sanspareil did not succeed in completing the mileage required, accomplishing only 22 miles of the required 60 miles run, at an average speed of 14 miles an hour. The trial run was over a level length of 1½ miles, which had to be traversed twenty times continuously in each direction by each competing engine—with several intervals allowed for taking in coke and water—making a total journey of 60 miles, corresponding to a run from Liverpool to Manchester and back.

1829.—The "Rocket," made by Stephenson, Fig. 6, was the winner of the £500 prize in the competition, having run the whole 60 miles continuously—with stoppages for coke and water—at an average speed of 14 miles an hour, with a maximum speed of 24 miles an hour. This was the only locomotive with a tubular boiler, and the origin of the present locomotive boiler; it had a cylindrical boiler, 6 ft. long and 3 ft. 4 in. in diameter, containing 25 copper tubes, 3 in. diameter, and a separate firebox bolted at the back of the boiler 2 ft. long and 3 ft. 2 in. in width outside. The firebox was of copper, both inside and outside, with a 2½ in. water space at the sides and back; but the front below the boiler had a firebrick lining up to the tubes instead of a water space (Fig. 24); the crown of the firebox was connected by two tubes to the steam space of the boiler, and a pipe on each side connected the water spaces to the boiler. The front of the firebox below the boiler was faced with an iron plate bolted to the tube-plate, and lined with firebrick lumps 2¼ in. thick, secured to the iron plate by countersunk T-head bolts. The engine had inclined cylinders, 8 in. in diameter, fixed upon the firebox and working direct onto the crankpins upon the leading wheels, which were 4 ft. 8 in. in diameter; the cylinders were altered and lowered to a less inclination after working a few years. The Rocket worked eight years on the Liverpool & Manchester Railway, and was then removed to another line; it is now preserved in the South Kensington Museum, but has had the firebox altered at some time to a flat top, besides the alterations in the inclination of the cylinders.*

1830.—Two more engines with detached fireboxes, like the Rocket, were made for other lines, and then the "Northumbrian," Fig. 7, was made for the Liverpool & Manchester Railway, with the regular firebox that has served as the general type for all subsequent engines; but the cylinders were still at the firebox end of the engine.

1830.—The Planet, Fig. 8, followed immediately after, with the cylinders fixed in the smoke box and placed horizontal, and a crank axle to the driving wheel, which was placed next to the firebox. This formed the general type for the subsequent locomotives, until the increased size of engine required by increased loads, and the unsteadiness caused by the overhanging weight of the firebox, led to the addition of a separate pair of trailing wheels, making the six-wheeled engine, and forming the general type for subsequent railways.

1836.—The early six-wheeled engine is illustrated by Fig. 10 as in general use in 1836, the cylinders being increased to 12 in. in diameter, with 5-ft. driving wheels, and the weight being increased to 12 tons in working order.

1837.—Fig. 9 shows an exception in a four-wheeled engine, Bury's, which was the type exclusively used for several years in working the London & Birmingham Railway from the opening in 1837; but it was ultimately abandoned for heavier six-wheeled engines.

1841.—Fig. 11 is the long-boiler engine introduced by Stephenson in 1841, the special features of which were: All the wheels placed under the barrel of the boiler, which was lengthened for this purpose; the iron plate-frame in a straight piece from end to end of the engine, instead of the compound wood and iron frame previously used; and the cylinders bolted together inside, and to the plate-frames outside, with the slide-valves placed on edge in a center valve-chest and driven direct from the eccentrics, instead of horizontal slide-valves on the top of the cylinders driven through rocking-shafts, with the cylinders fixed in the tube-plate as in previous engines. This plate-frame and the mode of fixing the cylinders have since become universal, excepting in America, where the bar-frame has been adhered to. Fig. 11 shows the matured form of the long-boiler engine used in 1846, with coupled driving wheels and 15-in. cylinders.

1850.—Fig. 12 shows the express engines introduced on the London & North Western Railway in 1850 by McConnell ("Bloomer" class), a type that was extensively adopted for many years. The driving-wheels were increased to 7 ft. in diameter, with 16-in. cylinders, and the weight of the engine amounted to 32 tons.

1864.—Fig. 13 shows the special type of express engines by Connor, used on the Caledonian Railway from this time, having 8-ft. driving wheels and 16-in. outside cylinders, and weighing 30½ tons. These engines have been extensively used on that railway up to a recent time, and are specially noted as the first 8-ft.-wheel engines on the standard gage. (8-ft. wheels were in use on the broad gage from 1847.)

1870.—Fig. 14 shows the larger type of express engines in use on the Great Northern Railway from 1870 (Patrick Stirling's engine), with 8-ft. driving-wheels and 18-in. outside cylinders, weighing 44 tons. In this case the weight on the leading wheels was so great (18 tons) that a four-wheeled bogie was adopted, making an eight-wheeled instead of six-wheeled engine, and this construction has been adopted extensively in the subsequent large express engines on other lines. The single driving-wheels carry the very great weight of 18 tons, which is occasionally exceeded, but the more general practice in subsequent large express engines has been to have coupled driving-wheels.

1895.—Fig. 16 is an illustration of the size now reached in express engines, being the recent Great Western engine, with 20-in. cylinders, coupled 7-ft. wheels, and weighing 51 tons.

The English express engines generally, and the majority of the foreign engines, are coupled backwards, having the second pair of coupled wheels behind the firebox; but in a number of modern express engines a modification in the arrangement of the driving-wheels has been made, as shown in Fig. 15, that has an advantage of considerable importance. Both pairs of coupled wheels are placed in the center of the engine in front of the firebox, where they are under the center of gravity of the engine, and in the most advantageous position to utilize the weight of the engine for driving adhesion, and to equalize the weights on the two pairs of driving-wheels without resorting to the addition of a heavy dead-weight in the cast-iron foot-plate (extending to three tons), that is ordinarily used to make up the deficiency of weight on the second pair of driving-wheels—an unmechanical expedient that can only be looked upon as a compromise, and not a finally satisfactory arrangement. In the central position of both pairs of driving-wheels there is also the advantage of shortening the coupling-rods, and avoiding the necessity for limiting the length of the firebox by the limit practicable for the working length of coupling-rods at high speed.

The central coupled wheels, Fig. 15, were introduced in 1878 by Marié on the Paris & Lyons Railway, and 60 engines of that class were put upon that line for express service; the same type of engine has since been extensively used on six other continental lines, and is also used in the recent large compound engines on the London & North Western Railway. In these last engines a radial axle-box is adopted for the leading wheels, but in the others no special provision is made beyond extra side-play in the leading and trailing axle-boxes, and thinning the flanges of the second pair of driving-wheels. The length of the tubes is considerably greater than usual in many of the above engines (16½ ft. in the Paris & Lyons engines), but this does not appear to be essential to the central arrangement of driving-wheels, as in the engines on this plan upon the Belgian State Railway the tubes are only 12 ft. length.

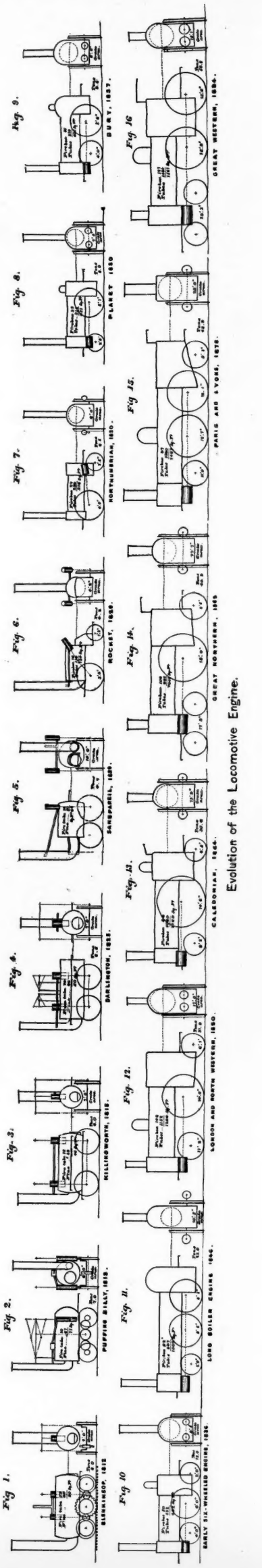
The following table shows the principal steps in the advance in size of locomotives:

Year.	Locomotive.	Cylinders diameter. Inches.	Driving wheels. Ft.	Driving wheels. Ins.	Engine weight. Tons.	Steam pressure. Lbs. per Inch.
1829	Rocket.....	8	4	8	4	50
1830	Planet.....	11	5	0	8	50
1836	6-wheeled engine.	12	5	0	12	50
1843	" " .	15	6	0	18	80
1859	" " .	16	7	0	32	100
1864	" " .	17½	8	0	30½	130
1870	8-wheeled engine.	18	8	0	45	140
1886	" " .	18	7	0	42	160
1895	" " .	19	7	0	48	175
1895	" " .	20	7	0	51	180

*The tubular boiler was suggested to Stephenson by Henry Booth, Secretary of the Liverpool & Manchester Railway, and he shared the £500 prize.

A Pneumatic Riveter on Brake Beam Work.

For some time the Monarch Brake Beam Company has had in use a pneumatic riveter, especially designed and set in a yoke, for riveting up the heads and fulcrums on the solid brake beam. The apparatus was supplied by the Chicago Pneumatic Tool Co. The rivets used are ⅝ in. diameter, and the riveter drives 1,200 of these in 10 hours. In writing of this the Brake Beam Company says that one of the objections heretofore urged against a beam of this character has been the difficulty in obtaining a metal to metal contact between the malleable iron heads and fulcrums, and the steel section known as the compression member. With this riveter, the work is so thoroughly done that the contact between the malleable iron and the steel is complete and perfect, the riveter accomplishing the operation in such a way that it completely fills the scientific purpose of a riveter, viz., that it makes the two pieces riveted together so completely one that they are practically inseparable. By using this pneumatic riveter, and driving the rivets hot, the holes in both the malleable iron and the steel become filled with the hot rivets, thus overcoming an objection heretofore urged, that the riveted sections worked loose.



They further say that they are more than satisfied with the work of the riveter and contemplate using several more of them.

Some Recent Rogers Locomotives.

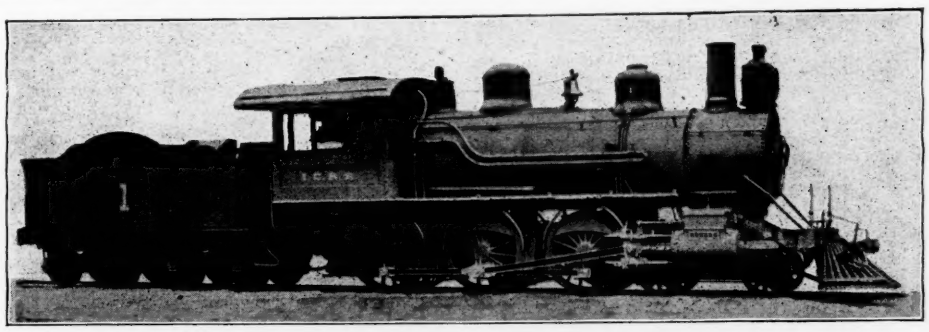
The engraving shows a 10-wheel freight locomotive recently built by the Rogers Locomotive Co., for the Illinois Central Railroad. Nine of these have been built. These engines are powerful and evidently designed for pretty high freight-train speed. The cylinders are 20 in. x 28 in., the weight on drivers 62 short tons, the boiler pressure 180 lbs. and the driving wheel diameter 63 in. The driving axles are nickel steel and the driving wheel centers cast steel. These engines are from designs by Mr. William Renshaw, Superintendent of Machinery of the Illinois ral. The principal specifications follow.

Illinois Central Ten-Wheeled Freight Locomotives.

Cylinders	20 in. x 28 in.
Drivers, diameter	63 in.
Driving wheel material	Cast steel
Driving axle material	Nickel steel.
Journals	8½ in. x 11 in.
Driving wheel base	13 ft. 6 in.
Total wheel base of engine	24 ft. 4 in.
Weight on drivers	123,900 lbs.
" " truck	40,500 lbs.
" total	164,400 lbs.
Heating surface, tubes	2,228.32 sq. ft.
" " firebox	184.03 sq. ft.
" " total	2,412.35 sq. ft.
Grate area	27.30 sq. ft.
Tubes, diameter 2 in.	Length 14 ft. 0 in.
" thickness No. 12 iron	Number 304
" material No. 1-3 N. T. W. special I. C. brand No.4-9 Allison brand.	
Grate, length 120 in.	Width 32¾ in.
Boiler, type	Extended wagon top
" diameter, outside front	66 in.
" material No. 1-8 carbon steel, No. 9 Otis steel	
" working pressure	180 lbs.
" thickness of barrel	5/16 in.
" " " dome course	5/8 in.
" " " crown	3/8 in.
" " " tube	5/16 in.
" " " side	5/16 in.
Wheels, engine truck, diameter	33 in.
" " " kind	Cast-iron, spoke center McKee Fuller.
Tender, capacity	5,000 gals.
" frame	White oak
" trucks	Fox pressed steel
" wheels, diameter	36 in.
" " kind	Steel tired, plate center
Safety valves	Two 3 in. Ashton, 1 muffled
Lubricators	No. 9 Nathan—one
Brakes	Westinghouse American Sch. X. M.
Boiler covering	Magnesia sectional
Metallic packing	U. S.
Couplers	McKeen pilot, freight car ten.
Bell ringer	Hegginbotton, for air
Tires	Krupp crucible and open hearth
Sanding device	Leach's pneumatic
Injectors,	One No. 10 Nathan simplex, one No. 10 Otis style A
Springs	French
Brake beams	Monarch
Driving boxes	Cast steel, Cicero bronze bearings

Texas & Pacific Engines.

The Rogers Works have also built recently two



Illinois Central Ten-Wheel Freight Locomotive.

10-wheel passenger engines for the Texas & Pacific. These are from designs by Mr. J. W. Addis, Superintendent of Motive Power. Specifications follow.

Texas & Pacific Ten-Wheel Passenger Locomotives.

Cylinders	19 in. dia. x 26 in. stroke
Drivers, diameter	67 in.
Driving wheel material	Cast steel
Driving axle material	Soft steel; journals, 8½ in. x 10 in.
Driving wheel base	13 ft. 0 in.
Total wheel base of engine	24 ft. 0 in.
Weight on drivers	115,000 lbs.
" " truck	41,500 lbs.
" total in working order	156,500 lbs.
Heating surface, tubes	2,051.7 sq. ft.
" " firebox	140.9 sq. ft.
" " total	2,192.6 sq. ft.
Grate area	30.95 ft.
Tubes, diameter 2 in.	Length 13 ft. 9 in
" thickness No. 11	Number 285
" material	Iron
Grate, length 106⅛ in.	Width 42 in.
Firebrick	On four 2-in. water tubes
Boiler, type	Extended wagon top, 1⅛ in. radial stays
" diameter, outside front	62 in.
" material	Otis steel
" working pressure	190 lbs.
" thickness of barrel	5/8 in.
" " " dome course	1/2 in.
" " " crown	7/16 in.
" " " tube	1/2 in.
" " " side and back	5/8 in.
Wheels, engine truck, diameter	33 in.
" " " kind	Steel tired, cast-iron spoke center.
Tender, capacity	4,300 gals.
" frame	10 in. steel channels
" trucks	Diamond arch bars, with American cast steel bolsters.
" wheels, diameter	33 in.
" " kind	Cast iron, double plate chilled tread
Safety valves	Two 3-in. Coule muffled
Lubricators	One No. 9 Nathan triple sight feed
Headlight	Pyles' National Electric, 23 in. diam.
Brakes	Westinghouse American on all wheels
Boiler covering	Asbestos cement
Metallic packing	U. S.
Couplers	Gould pilot, T. & P. Auto., tender
Bell ringer	Golmar pneumatic
Tires	Krupp crucible steel
Sanding device	Houston pneumatic double
Injectors	Two No. 8 Monitors
Springs	Pickering
Brake beams	Interchangeable hollow
Steam heat	Safety Car H. & L. Co.'s.
Blow-off cocks	Pneumatic
Driving boxes	Phosphor bronze
Train signal	Westinghouse
When built	Nov., 1898

New York Anti-Scalper Law Dead.

After varying success in the lower courts, the so-called Anti-Scalper law has been declared unconstitutional by the New York Court of Appeals. The law is Chapter 506 of the Laws of 1897, making it a state prison offense to issue, sell, or offer to sell any passage ticket upon any vessel or railroad train unless the seller be an authorized agent of the owners of the vessel or of the company running such train. The authority must be in writing. An unauthorized ticket broker's office is declared a disorderly house. Tickets not used or partly used are redeemable by the selling company. Punishment for violation of the law was imprisonment varying from six months to two years.

The law went into effect in September, 1897, and the scalpers made a test case. George Tyroler, of New York City, sold a ticket to Norfolk, Va., and a lower court decided that he had broken the law. An appeal was taken to the Appellate Division of the Supreme Court, which likewise decided against Tyroler.* The case was taken to the Court of Appeals, which has now decided that the law was unconstitutional. The counsel for the defense was the firm of Guggenheimer, Untermyer & Marshall.

The Court of Appeals was divided on the questions at issue. Chief Judge Parker wrote the prevailing opinion, which is concurred in by Judges O'Brien, Haight and Vann. Two dissenting opinions were written, one by Judge Martin and the other by Judge Bartlett. Judge Gray concurs in the dissenting opinions.

The prevailing opinion is written by Chief Judge Parker. His opinion holds that the sale of tickets absolutely is not prohibited by the act, nor does it limit the right to sell tickets to travelers to the particular transportation company over whose route he desires to be conveyed. This last assertion is in conflict with the position taken by the judge who wrote in the Appellate Division, for there the judge assumes that the effect of the provision is that a corporation shall sell only through its agents, and was merely a declaration that the corporation itself was to sell its tickets.

The opinion proceeds: "The first section and the first part of the second section do restrict the sale of passage tickets to agents specially authorized by transportation companies, and if there was nothing else in the statute upon the subject it would bear the construction put upon it, that its only effect is to confine the right to sell passage tickets of a corporation to that corporation itself, which can act only through agents; but sandwiched in between the opening and the closing sentences of the second section may be found the following: 'Nothing in this section or chapter contained shall prevent the properly authorized agent of any transportation company from purchasing from the properly authorized agent of any other transportation company a ticket for a passenger, to whom he may sell a ticket to travel over any part of the line for which he is the properly authorized agent, so as to enable such passenger to travel to the place or junction from which his ticket shall read.' Thus we see that the moment a man becomes the agent of a transportation company, he is by that designation authorized to buy tickets of any other transportation company in the United States, or the world, and may sell such tickets to any person who applies for them." In the sale of tickets of other transportation companies than that of which he is an agent, he necessarily acts as a broker. He can buy the tickets and sell them again, making profit according to the competition between the various railroads. Clearly the agent in the purchase and sale of tickets of foreign corporations is not selling the tickets of the company appointing him. The agent is not alone selling tickets of his principal; for the state by this statute attempts to clothe him with a power it takes from all other citizens, i. e., to deal in tickets of as many other transportation companies as he may make satisfactory arrangements with.

Another interesting feature of this remarkable statute is that the buying and selling of passage tickets is not abolished; it is only condemned where the seller has not authority from some transportation company to act as its agent. It has happened before that for the protection of the people the law-making power has provided for an examination to ascertain whether applicants possessed suitable qualifications for the positions applied for, or the business sought to be engaged in; but in no instance has it conferred a general and unlimited power of appointment upon a class of persons or corporations wholly unconnected with the state government. It may possibly be that there was such a situation as would have justified an enactment placing some restrictions upon those engaged in the selling of passage tickets and prescribing penalties by way of fine and imprisonment for those who should break over such restraints. Our excise legislation affords an illustration. But this act simply turns over to the transportation companies the selection of those who are hereafter to be permitted to sell tickets. It imposes no restraint whatever upon the appointing power nor upon the agents selected, other than that in the purchase of tickets he must confine himself to the properly authorized agents of the transportation companies. The business of buying and selling tickets, as to such agents, continues to be a legitimate business; but to all other citizens is denied, and a sale by other than an agent constitutes a felony.

The act itself is silent as to the motive of its enactment by the Legislature, and it contains no suggestion as to the public interests which its purpose is to subserve.

Ticket brokerage as a business has existed for years.

The opinion proceeds: "It is asserted that the traveling public and the transportation companies have been defrauded by brokers. The tendency of the times is to rush to the Legislature for a cure for all the citizens' grievances, whether real or imaginary, and many novel experiments in legislation are the result. But usually in cases of wrongs penalties have been provided. It is novel legislation indeed that attempts to take away from all the people the right to conduct a business because there are wrong-doers in it, for whose conduct the people suffer. But where in this statute is to be found the evidence that its purpose is to prevent fraud? In the title of the act, answers counsel, and with that answer he has to be content. For while the act is entitled 'Frauds in the sale of passage tickets,' the body of the statute does not contain any reference to forged, altered, used, or stolen tickets. The sale of such tickets is made a punishable offence under other portions of the Penal Code. The provisions of the act, therefore, have reference to the selling of valid tickets, regularly issued by a transportation company. Can a legislature declare such sales to be fraudulent, or prohibit them on the ground that it tends to prevent fraud? If the act prohibited is fraudulent, there can be no doubt that the Legislature, under its police power, may provide for its punishment; but whether it may under such power interdict the sale of a valid ticket by one person to another, upon the pretext that fraud will thus be prevented, presents a very different question. I confess I am unable to see how such a sale defrauds a transportation company. If a transportation company sells a ticket from New York to San Francisco, it undertakes to carry the holder from one place to the other. It costs the company no more to carry one person than it does the other. How, then, can it be defrauded or in any way prejudiced by the transfer of such a ticket by the purchaser to another purchaser? It is said that the prohibtion of such a sale protects the traveler from being defrauded. If it is a sale of a valid ticket, no fraud can possibly result; and if it is not a sale of a valid ticket, the sale is fraudulent, and is prohibited by other provisions of the Penal Code.

"It is not contended that the business of ticket brokerage is in itself of a fraudulent character. The business can be honestly conducted; it has been so conducted in the past by the honest men engaged in it; and the worst that is asserted is that there are some men engaged in the business who have imposed on the public. The same assertion can be made with equal truth of every business, trade and profession. Because some coal dealers and vendors in sugar cheat in weight, and dealers in paints and oils in measurements, and in tobacco in quality, it has not hitherto, we venture to say, been thought the proper remedy to make it a felony for persons to hereafter engage in such business unless they shall have been duly appointed as agents by the corporations manufacturing or producing the product.

"Still another motive for this enactment is suggested, and that is that its real purpose is to enable transportation companies to compel others with which they may enter into pooling arrangements, to preserve their agreements from secret violation, which is frequently the outcome under the present ticket brokerage system, which offers an avenue by which the weaker corporation to such an agreement can dispose of its tickets at a price lower than that agreed upon.

"Again, it is said that the ticket brokers enable the railroads to engage in unfair competition. This is accomplished by the sale to the broker, at much less than the regular rates, of a block of tickets that the broker is enabled to sell to his customers. An opinion is cited in which the court in another jurisdiction denounces the ticket scalper for engaging in a business of this character, and pronounces such business fraudulent alike in its conception and operation; but we pass this opinion without other comment than to say that whatever may be regarded as the law in other jurisdictions, in this one it is well established that the public welfare is best subserved by the encouragement of competition, and hence this so-called reason furnishes no support to the claim that this legislation was for the public good.

"Under this law the business of selling tickets continues to be regarded as a lawful and legitimate business. Public policy by statute is still declared to favor a business which recognizes the propriety of the middleman between the passenger and the transportation company, but the right to engage in it is denied to the general public. The question, then, is whether the organic law prohibits legislation of this character."

Judge Parker quotes from numerous decisions rendered on the personal liberty section of the Constitution, and says:

"Arguments certainly are not needed in the light of these decisions to support the assertion that the 'liberty' of this relator (Tyroler) and other citizens of the state to engage in the business of ticket brokerage is assailed.

"The statute is in contravention of the state Constitution and is void unless its enactment by the Legislature constituted a valid exercise of the police power. It may be conceded that it is within the power of the Legislature to regulate the manner in which certain kinds of business may be conducted; that it may require one seeking to engage in a given pursuit to secure a state license and pay a tax, and may require that the persons so desiring shall be competent and morally qualified, but none of these methods was adopted. No attempt is made to exclude persons of bad character, nor are the public authorities given the power to determine the character of such persons, but the transportation companies alone are vested with the power to allow whomsoever they will to engage in the business.

"Stringent rules, undoubtedly, may be enacted to

*See Railroad Gazette, April 1, 1898, p. 234. For the statute, see May 28, 1897, p. 375.

punish those who are guilty of dishonest practices, but to cut up, root and branch, a business that may be honestly conducted to the convenience of the public and the profit of the persons engaged in it is beyond legislative power. If the law were otherwise, no trade or business or profession would escape destruction at the hands of the Legislature if a situation should arise that would stimulate it to exercise its powers. For in every field of endeavor can be found men who seek profit by fraudulent processes. It is well known that no business can be suggested through which innocent parties may not be occasionally victimized, but because of that fact honest men cannot be prevented from engaging in their chosen occupations."

Justice Martin, in his dissenting opinion, says:

"The case involves the validity of a statute which continues a protection to the public and to transportation companies against fraud in the sale of passage tickets, which has existed in this state in substantially the same form for more than 40 years. Therefore, the present statute cannot be held unconstitutional without practically determining that for all time the affairs of this state in that respect have been controlled by statutes which were invalid, as being in excess of the powers of the Legislature to enact. The purpose of this statute was to prevent fraud and to protect the purchaser and the railroad company.

"To hold that this act is unconstitutional would practically annihilate the police power of the Legislature. An arbitrary and unauthorized interference by the judiciary with the administrative affairs of the state is fraught with quite as much danger as would follow legislative interference with judicial affairs. When courts seek to control or in effect repeal acts of the Legislature by holding them in conflict with some non-existent or doubtful constitutional limitation, their action is mere usurpation."

Judge Bartlett, in his dissenting opinion, traverses the ground covered by Justice Martin, and says concerning the enactment of the statute: "This is certainly not an abdication of Governmental functions, but a wise and proper exercise of them."
but a wise and proper exercise of them." He says, further, that there was no property in a ticket bought by an unauthorized agent from a transportation company, and that the statute might be void as to the passenger holding an unused ticket, and valid as to the ticket broker.

The St. Louis & Northern Railroad.

Mr. Thos. F. Woodlock writes from New York to the Economist, London, as follows:

About a year ago the Chicago Terminal Transfer Company, successor to the old Chicago & Northern Pacific Company, was threatened with the loss of one of its most important tenants, viz., the Baltimore & Ohio road. This would have been a very serious matter for the Terminal Company, and unusual efforts were made by the managers of the Terminal Company to find a new tenant.

About this time certain financial interests connected with the Terminal Company opened negotiations with the parties controlling the St. Louis, Peoria & Northern road, 165 miles long, between St. Louis and Peoria, and secured control of that road. The plans provided for building a line from the nearest point on the St. Louis, Peoria & Northern into Chicago, and also for the extension of the road in a northwesterly direction into the State of Iowa. An agreement was entered into with the Chicago Terminal Transfer Company by which the new line (to be called the St. Louis & Northern) contracted to rent terminals from the Terminal Transfer Company on the following terms: The Terminal Company was to provide facilities for the new line up to July 1, 1910, in return for the sum of $880,000 cash, to be paid in certain instalments, and after 1910 it was to receive $150,000 per annum and taxes and maintenance expenses.

I understand that the suggestion first was that the new company should give the Terminal Company something over $1,000,000 in its new 4 per cent. bonds, but these bonds were finally sold, and the Terminal Company will get the cash. In point of fact, already $176,000 cash has been placed in trust for the company, according to the arrangement.

In view of these facts, it is reasonable to assume that Chicago Terminal Transfer interests are practically the parents of the new line. Its promoters have their headquarters at the New York office of the Terminal Company, and I understand that Terminal Company officers have taken an active part in the promotion and preliminary work on the scheme. High officials of the Terminal Company are identified with the project in all its aspects. Furthermore, as if to set the Terminal Company's stamp on it, I understand that Mr. Adams, president of the company, and American representative of the Deutsche Bank of Berlin, is one of the leading spirits in the whole enterprise, and that the Deutsche Bank of Berlin has embarked therein the sum of $2,000,000. This makes the matter doubly interesting to foreign investors, who may not be thoroughly aware of what is involved in a new Chicago-St. Louis line.

There are three lines directly between Chicago and St. Louis, viz., the Chicago & Alton, the Wabash, and the Illinois Central. The distance by the Alton and the Wabash is practically the same, viz., about 285 miles; by Illinois Central it is about 300 miles. There are, of course, many less direct routes involving greater mileage. The new line, according to its promoters, will be about 310 miles between the two cities, in fact, it is claimed that even this distance may be shortened. Consequently it is clear that another direct Chicago-St. Louis line will be added to the three mentioned above. This it is which has alarmed and angered the most substantial financial interest on this side of the water.

It is not claimed by the promoters of the new line that another road is needed between the two cities of Chicago and St. Louis. These people claim that the real object of the enterprise is to open up a new through line to the northwest through Clinton, Iowa, in connection with the Mobile & Ohio, connecting St. Louis and New Orleans, and the development of certain coal properties lying on the St. Louis, Peoria & Northern road, which already supply coal to St. Louis and Peoria. The close affiliations, however, with the Chicago Terminal Transfer Company, as described above, tell a different story, and everyone here considers the road simply as a new Chicago-St. Louis line, originally devised and organized in the interest of the Chicago Terminal Transfer Company.

As such it has the determined disapproval of the most substantial interests in New York. Many large houses have refused to go into the syndicate organized to promote it on the ground that to build new roads between towns like Chicago and St. Louis in the present condition of railroad business and railroad rates is equivalent to an act of piracy. Others have refused to go into it on the ground that its prospects of success are not sufficiently inviting. Nevertheless, the syndicate of $13,000,000 has been formed—in fact, over-subscribed—and arrangements have been made to begin work at once. The effect will be to add what may become another serious disturbing element in the southwestern railroad situation, with large possibilities for working injury to existing lines, especially to Alton, Wabash and Illinois Central. Here we have a terminal company in Chicago largely owned by European investors, deliberately fostering fresh competing lines in a territory where none are needed, and working hard to introduce into an already crowded field another competitor. And yet, no doubt, the foreign owners of Chicago Terminal Transfer securities will lay all the blame later on to wicked American railroad speculators, forgetful of the fact that they themselves are particeps criminis.

Train Accidents in the United States in October.

COLLISIONS.

Rear.

6th, on Chicago & Northwestern, near Cudahy, Wis., a passenger train ran into the rear of a preceding freight, and several cars were wrecked. The fireman was killed.

6th, on Oregon Short Line, near Glenn's Ferry, Idaho, a passenger train running at full speed ran into the rear of a locomotive standing on the main track, and the tenders of the two engines drawing the train, and of the standing engine, were wrecked. The engineman of the standing engine was injured. It is said that the waiting engine had been ordered to be ready to help the passenger train up a grade, but that the passenger train had, by some confusion of orders, secured a helper before reaching the station where the collision occurred.

6th, on Missouri Pacific, near Hiawatha, Kan., a freight train broke in two, and the rear portion afterward ran into the forward one, derailing 13 cars. Two men stealing a ride were killed.

8th, on New York, New Haven & Hartford, at Harlem River Station, New York City, a passenger train approaching the station at uncontrollable speed collided with an empty engine standing about 100 ft. beyond the station, damaging both engines and breaking the windows and lamp globes in the cars. The cars were packed full of passengers, many of them on their feet ready to go out, but only one received much injury. The cock in the air brake pipe at the front end of the foremost car was found, after the collision, to be closed, and this was the cause of the failure of the engineman to control the speed of the train. The brakes throughout the train were tested a few minutes before it left Morris Park, about five miles from Harlem River.

9th, on Nashville, Chattanooga & St. Louis, at Graysville, Ga., a freight train approaching the station broke in two, and, the engine being stopped soon after, to take water, the rear portion of the train ran into the forward one. The fireman, who was on the tender, was thrown off and killed.

10th, on Southern Railway, near Niota, Tenn., a freight train ran into the rear of a preceding freight, wrecking the caboose and several cars. Two trainmen were injured. There was a dense fog at the time.

10th, on Chicago & Northwestern, at Maywood, Ill., a freight train ran into the rear of a preceding freight at high speed, wrecking 2 cars. The second train received a clear automatic block signal at the entrance of the section occupied by the foremost train. It is believed that the signals had been meddled with by tramps.

10th, on Southern Railway, at Athens, Tenn., collision between a gravel train and a freight, wrecking several loaded cars. The engineman of the gravel train and the conductor of the freight were fatally injured.

11th, on St. Louis, Keokuk & Northwestern, at Seeburgers, Mo., a local freight train standing at the station was run into at the rear by a following freight, drawn by 2 engines, and several cars were badly wrecked. A fireman was killed and an engineman injured.

11th, 11 p. m., on Atchison, Topeka & Santa Fe, near White Deer, Tex., a freight train ran into the rear of a preceding passenger train, damaging the engine and 3 cars. The express messenger was injured.

13th, 3 a. m., on Central of Georgia, near Motts, Ga., a freight train descending a grade broke in two, ahead of the third car from the caboose; the conductor, instead of bringing the rear portion to a stop, allowed it to follow the front portion 14 miles to Columbus; just as Columbus was reached the 2 foremost cars of the rear portion broke loose and collided with the cars ahead, damaging 2 cars.

15th, on Great Northern, near New Duluth, Minn., a freight train approaching the station at uncontrollable speed ran into another freight switching on the main track, damaging several cars. Four employees were injured.

17th, 4 a. m., on Philadelphia & Reading, near Birdsboro, Pa., a freight train standing at the station was run into at the rear by a following freight and the caboose was wrecked. The wreck took fire and 6 cars were damaged. A brakeman was injured.

18th, on Chicago, Milwaukee & St. Paul, near Eureka, S. D., a passenger train ran into a freight car, which had been blown out of a siding to the main track, badly damaging the engine and wrecking the car. The engineman was injured.

18th, 10 p. m., on Philadelphia & Reading, at Perry, Pa., a freight train ran into the rear of a preceding freight, wrecking the caboose. A brakeman was killed and a conductor injured.

19th, on Baltimore & Ohio, at New Concord, O., a passenger train, drawn by 2 engines, ran into the rear of a preceding freight, damaging one engine and wrecking the caboose. A freight conductor was killed and 1 fireman was injured.

20th, 5 a. m., on Southern Pacific, near Missouri City, Tex., a passenger train ran into a freight car, which had been blown out of a side track, derailing the engine and wrecking the freight car. The engineman was killed and the fireman and one brakeman were injured.

22d, on Chicago, Rock Island & Texas, near Fort Worth, Tex., a freight train descending a grade broke in two and the rear portion afterward ran into the forward one, wrecking 4 cars loaded with wheat. In one car were 8 tramps, of whom 5 were killed and 3 injured, 2 probably fatally.

22d, on Atchison, Topeka & Santa Fe, at Mulhall, O. T., a freight train standing at the station was run into at the rear by a following freight, wrecking the engine, caboose and 8 cars. Three trainmen, one passenger and one tramp were injured.

24th, 11 p. m., on Cincinnati Northern, at Celina, O., a freight train broke in two and the rear portion afterward ran into the forward one, wrecking several cars. A tramp was killed.

26th, 5 a. m., on Union Pacific, at Silver Creek, Neb., a freight train preparing to stop at the station was run into at the rear by a following freight, and the caboose and 3 cars were wrecked. The engineman, fireman and one brakeman were killed, and another brakeman was injured.

26th, on Union Pacific, at Omaha, Neb., a freight train ran over a misplaced switch and into the rear of a preceding freight, wrecking the engine and 4 cars. The engineman, fireman and one brakeman were killed and another fireman was injured.

28th, on Philadelphia & Reading, at Hummelstown, Pa., collision between a passenger train carrying soldiers and a through freight train, damaging one passenger car and injuring 6 soldiers. It is said that the freight approached the passenger from the rear and that the passenger flagman did not properly protect his train. Four freight cars and a car of horses were wrecked.

And 31 others on 23 roads, involving 6 passenger and 41 freight and other trains.

Butting.

5th, 11 p. m., on Burlington & Missouri River, at Indianola, Neb., butting collision of freight trains, wrecking several cars. One engineman, one fireman and one brakeman were killed, and a drover and 3 trainmen were injured. One of the trains approached the station at uncontrollable speed. It is believed that the engineman (who was killed) had forgotten his meeting order.

9th, on Georgia Railroad, near Clary, Ga., butting collision of freight trains, badly damaging both engines. A brakeman and a tramp were injured. It is said that the train which arrived at Clary first ran past the station to back into the side track without properly protecting itself by a flag.

9th, on Pittsburgh Junction road, near Pittsburgh, Pa., butting collision between a freight and a gravel train; 5 employees injured.

10th, on Chicago, Rock Island & Pacific, near Topeka, Kan., butting collision of freight trains, one of which was standing still. Both engines and 5 cars were wrecked. The standing train was protected by a block signal, but the engineman of the other disregarded it.

15th, on Great Northern, near Great Falls, Mont., butting collision of freight trains, badly damaging both engines and several cars. One engineman and one brakeman were killed and one fireman was injured.

18th, on Great Northern, at Berwick, N. D., a freight train backing into a side track pushed out upon the main track some freight cars which were standing there, and these were run into by a passenger train. The engine and both freight cars were wrecked. The engineman, fireman and one tramp were injured.

18th, 6 p. m., on Atchison, Topeka & Santa Fe, near Lemont, Ill., butting collision between a passenger train and a freight, badly damaging both engines, a baggage car and several freight cars. The passenger engineman jumped off and was injured. Two passengers and a brakeman were also hurt.

19th, on Bedford Belt, near Bedford, Ind., butting collision between a passenger train and a work train, badly damaging the engines. Four trainmen were injured.

24th, on Baltimore & Ohio, at Cassel's, O., butting collision of freight trains, wrecking both engines and 4 cars. One engineman was injured.

24th, on Wheeling & Lake Erie, near New Cumberland, O., butting collision of freight trains, wrecking both engines and a large number of cars. It is said that there was a mistake in delivering a telegraphic order.

30th, 10 p. m., on Union Pacific, near Fremont, Neb., butting collision of freight trains, wrecking both engines and 15 cars. Two trainmen and a tramp were injured. It is said that the westbound train failed to notice signals carried by a preceding train, which should have warned it to wait for the eastbound.

And 9 others on 9 roads, involving 2 passenger and 16 freight and other trains.

Crossing and Miscellaneous.

3d, on Chicago & Northwestern, near Eagle Grove, Ia., the engineman of a freight train finding that he would be unable to reach Goldfield, where he was to meet a passenger train, cut loose from his train and carried a flagman ahead. On returning he collided with his own train, which was still in motion, wrecking one car. The engineman was injured.

4th, near Kansas City, Mo., collision between St. Louis and San Francisco, a passenger train and a switching freight train of the Belt Line. The conductor and a brakeman of the passenger and the engineman of the freight were injured.

8th, on Long Island road, at Flushing, N. Y., a passenger train ran over a misplaced switch and collided with an empty passenger train standing on the side track, pushing the latter some distance back into a freight train on the same track. One passenger was injured.

8th, in the joint yard of the Chicago, St. Paul, Minneapolis & Omaha and the Fremont, Elkhorn & Missouri Valley, at Omaha, Neb., a freight train of the latter road, drawn by 2 engines, ran into the rear end of an empty passenger train of the former road, standing on the main track, wrecking a dining car. The conductor and a waiter of the dining car were killed, and 2 other employees and 1 tramp were injured. The freight train should have run on to a side track just before reaching the passenger train, but it appears that the trainman charged with the duty of throwing the switch for this purpose failed to do so.

9th, on Baltimore & Ohio, near Martinsburg, W. Va., collision between passenger train No. 8 and an empty engine, at a crossover. The engineman of the empty engine was killed and 2 other trainmen were injured.

12th, on Pittsburg, Fort Wayne & Chicago, at West Lafayette, O., collision, at a meeting point, between a passenger train and a freight, both moving slowly. The engineman of the passenger train was injured.

12th, on Southern Railway, at Culpeper, Va., a freight train entering a side track was run into by a Chesapeake & Ohio freight from the opposite direction, which approached at uncontrollable speed, and 2 cars were wrecked. Two employees were injured.

18th, on Cleveland, Lorain & Wheeling, at Urichs-

ville, O., a freight engine ran into a caboose, damaging the caboose and injuring a conductor.

21st, on Southern Pacific, near Balfour, Utah, the engine of a freight train, having been sent forward to carry a flagman, returned at uncontrollable speed and collided with the foremost car. The tender and one car were wrecked and the engineman and one brakeman were injured.

21st, on Union Pacific, Denver & Gulf, at 36th street, Denver, Col., a passenger train of the Union Pacific collided with a switching engine, badly damaging both engines. One engineman was scalded and a brakeman and one passenger were injured.

25th, on Cincinnati, Hamilton & Dayton, at Dayton, O., collision of locomotives in the yard, crushing the cab of one of them. A fireman was severely scalded.

26th, on Pennsylvania road, near Carney, Pa., collision of freight trains, damaging 15 cars. One engineman and one fireman were injured.

29th, on Wheeling & Lake Erie, at Warrenton, O., collision of freight trains, badly damaging both engines and several cars. One employee was killed. There was a dense fog at the time.

29th, on Central of Georgia, near Odens, Ala., a freight train ran into a work train, badly damaging the engine and several cars. Three employees were injured.

31st, on Baltimore & Ohio, at Newark, O., collision of locomotives, one of which, having been deserted, ran away some distance and collided with a car of lumber standing on the main track. The fireman was badly scalded.

And 22 others on 19 roads, involving 7 passenger and 34 freight and other trains.

DERAILMENTS.

Defects of Roadway.

1st, on Chicago, Milwaukee & St. Paul, near Spencer, Ia., a freight train was derailed at a small pile bridge, which had been weakened by fire, and the engine and 5 cars were ditched. The roadmaster, riding on the engine, jumped off and was killed. The engineman and fireman were injured.

7th, on Southern Pacific, near Colfax, Cal., 2 cars of a passenger train were derailed by a loose rail and overturned. One passenger was injured.

18th, on Great Northern, near Everett, Wash., a freight train broke through a bridge, and the engine and 7 cars fell into the river. The engineman was killed and the fireman injured. It is said that the bridge had been weakened by high water.

22d, 1 a. m., on Kansas City, Pittsburgh & Gulf, near Maryville, Mo., a passenger train was derailed and 3 cars were wrecked. The conductor, one brakeman and a passenger were injured, the latter fatally. It is said that the derailment was due to a broken rail.

And 4 others on 4 roads, involving 4 freight trains.

Defects of Equipment.

11th, on Missouri Pacific, at Bandera, Kan., a freight train was derailed by a drawbar, which was pulled out and fell on the track, and 8 cars were ditched. A drover was injured.

And 14 others on 13 roads, involving one passenger train and 13 freight and other trains.

Negligence in Operating.

16th, 8 p. m., on Chicago & Erie, near Hepburn, O., 16 cars in a freight train were derailed and half of them wrecked, by a large bridge timber, which fell off the side of a platform car.

17th, on Toledo & Ohio Central, at Dunkirk, O., a passenger train was derailed at a derailing switch and the engine and baggage car were ditched. The engineman was scalded.

21st, on Southern Pacific, at Oakland, Cal., a passenger train moving backward was run through a misplaced switch leading to a narrow gage track and 1 car was derailed. The conductor was injured.

25th, 8 a. m., on Central of New Jersey, in the middle of the 2-mile bridge across Newark Bay, a Philadelphia & Reading freight train ran into an open draw and the engine and 5 cars fell into the water, which is 45 ft. deep. There was a dense fog at the time. The train ran past a distant and a home signal set against it. Three of the freight cars, loaded with light merchandise, floated away, and lawless boatmen stole a barrel of whiskey out of one of them. The wreck fell clear of the draw, so that travel was not seriously interrupted.

And 9 others on 8 roads, involving one passenger train and 8 freight and other trains.

Unforeseen Obstructions.

6th, 10 p. m., on Chicago, Rock Island & Pacific, near Iowa City, Ia., a freight train was derailed and several cars fell down a bank. The fireman was killed and 3 other trainmen were injured. It is said that the derailment was due to the misplacement of a switch by persons who intended to wreck a passenger train.

16th, on Southern Pacific, near Glamis, Cal., a passenger train was derailed by sand, which had drifted on the track, and the engine, mail car, baggage car and first coach were ditched. A mail clerk was killed and the express messenger was injured.

20th, on Pennsylvania road, near Donohoe, Pa., a passenger train was derailed by an accidental obstruction and 3 cars were badly damaged. A brakeman was injured.

23d, on Baltimore & Ohio, near Keedysville, Md., a freight train was derailed by running over a horse, which had lodged in the sleepers of a small bridge, and the engine fell against 2 camp cars standing on a side track. A cook sleeping in one of the camp cars was injured.

And 2 others, involving one passenger train and one freight.

Unexplained.

4th, on Pennsylvania road, near Johnstown, Pa., a freight train was derailed and 16 cars were badly damaged. A man riding on one of the cars was killed and 2 other tramps were injured.

10th, on Missouri, Kansas & Texas, near South Canadian, I. T., a freight train was derailed and 6 cars were wrecked. A brakeman was injured.

12th, on Southern Pacific, near Templeton, Cal., a freight train was derailed and the engine and several cars fell down a bank. The engineman, fireman and 2 brkemen were badly scalded.

14th, on Toledo, Peoria & Western, near Canton, Ill., a freight train was derailed and 5 cars were wrecked. The conductor was killed.

23d, on Southern Pacific, near Camulos, Cal., a freight train was derailed and the engine and several cars were ditched, 5 of them being wrecked. The engineman was killed and the fireman badly injured.

24th, on Southern Pacific, near Gazelle, Cal., a freight train was derailed and a brakeman was badly injured.

25th, on Lehigh Valley, near Canastota, N. Y., a mixed train was derailed and the passenger car, baggage car and 1 coal car were ditched and overturned. Two trainmen were injured.

27th, 9 p. m., on Burlington & Missouri River, at Lincoln, Neb., a switching engine was derailed, and, with 3 freight cars, was badly wrecked. The engineman and fireman were injured.

And 55 others on 39 roads, involving 4 passenger and 51 freight and other trains.

OTHER ACCIDENTS.

17th, on Wilmington & Northern, at Joanna, Pa., the locomotive of a freight train was wrecked by the explosion of its boiler, and 4 trainmen were killed.

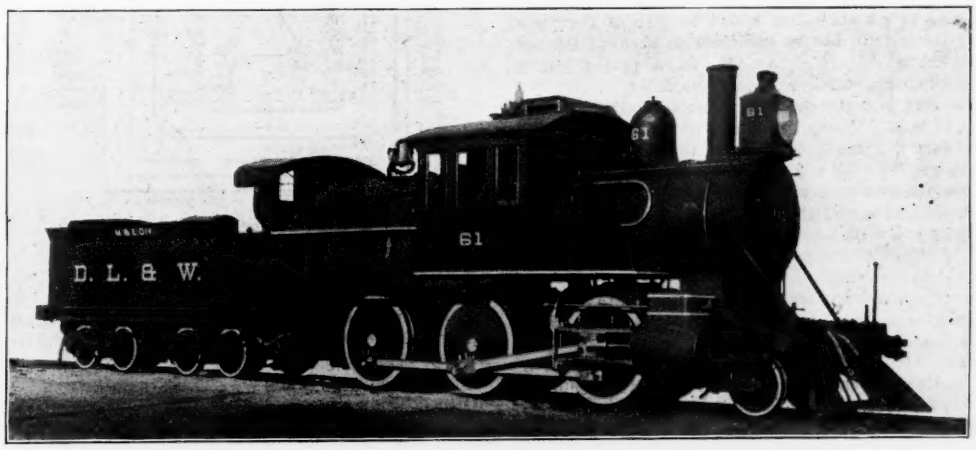
A summary will be found in another column.

Mogul Locomotive for the Delaware, Lackawanna & Western.

The Cooke Locomotive and Machine Co., of Paterson, N. J., has recently delivered to the Delaware, Lackawanna & Western Railroad two mogul freight engines. These engines were built from the designs of Mr. William H. Lewis, Master Mechanic. The general specification follows.

Mogul Engine—Delaware, Lackawanna & Western.

Gage	4 ft. 8½ in.
Weight in working order	138,500 lbs.
" on drivers	122,000 lbs.
" on truck	16,500 lbs.
Loaded weight of tender	80,000 lbs.
Total wheel base of engine	22 ft. 7 in.
Driving wheel base	14 ft. 9 in.
Wheel base of engine and tender	49 ft. 3¼ in.
Cylinder	19 in. dia.
"	26 in. stroke
Driving wheels	57¾ in. dia.
Engine truck wheels	30 in. dia.
Driving axle journal	8 in. x 10 in.
Engine truck axle journal	5½x8⅝ in.
Boiler, type	Wide firebox; straight top
" working pressure	180 lbs.
" dia. first course	60¼ in.
" fire box length	120 in.
" " width	96 in.
" style of grate,	Combined water tube and cast iron bars
" tubes, number	239
" " dia. and length	2 in. dia.; 12 ft. 11½ in. long
" thickness of shell	⅛ in. and ⅝ in.
" heating surface, tubes	1,611 sq. ft.
" " " firebox	152 sq. ft.
" " " —total	1,763 sq. ft.
" grate surface	80 sq. ft.



Mogul Freight Locomotive—Delaware, Lackawanna & Western.

Slide valve	Allen Richardson
" " travel	5¾ in.
Steam ports	1⅝ in. x 18 in.
Exhaust "	3 in. x 18 in.
Lap	Line and line inside, ⅞ in. out lap
Exhaust pipe	contracted pipe—single nozzle
Smoke box	Short extended
" " netting	2½ in. mesh
Center of boiler from rail	8 ft. 3½ in.
Top of stack " "	15 ft. 0 in.

Tender.

Frame	Steel angles
Truck, style	Square, wrought iron
" wheel	33 in. diam.
" axle journal	4¼ in x 8 in.
Tank, water capacity	3,700 gallons
" coal "	8 tons

Special Equipment, Etc.

Boiler sheets	Steel, Central
Flues	National, Lackawanna Special
Driving wheel tires	Midvale
Engine truck wheels	Boies No. 2, Midvale tires
Tender " "	Boies No. 2, " "
Springs	National
Brake	Westinghouse American
Injector	Monitor
Lubricator	Nathan
Train signal	Westinghouse
Bell ringer	Snow
Steam gage	Ashcroft
Safety valves	Consolidated
Piston packing	Jerome
Valve stem packing	Jerome
Jacket	Apollo iron
Boiler lagging	Asbestos cement
Sanding apparatus	Leach
Steam heating	Gold
Couplers	Gould
Brake beams	Marden, with Christie heads

The young technical graduate of to-day goes from his class room better equipped mentally and instrumentally for railroad location than was his predecessor of the college or field a quarter of a century ago—the man who made so much of the location of this country. It would be queer if it were not so. The amount of knowledge available for guiding the locating engineer has greatly increased in 25 years. Even the old art of surveying has not stood still, but has advanced long strides in two decades.

That a value, more or less definite, could be assigned to a mile of distance, a foot of rise and fall, or a degree of curve saved, was appreciated in this country at least as far back as the location of the Pennsylvania Railroad, on which a mile of distance was valued at $53,000 and a degree of curvature at $50. But it is true that in the days of rapid railroad building, long after the construction of the Pennsylvania, the demand for miles of railroad, the desire of investors to build railroad, were so great that almost every man who could run a transit and handle a party was pressed into service, regardless of whether he understood what was then known of the economic principles governing location. Then there were a few thoughtful men, wisely trained, boldly striking out for themselves and planning new work to meet new conditions, while for every one of these there was a host of others applying blindly the adopted standards or limits of the first, but to totally different conditions. Because the Pennsylvania operated successfully (?) 116-ft. grades, such grades were adopted on other lines, for no other apparent reason than that they seemed to involve less first cost, and that they could be used, as shown by the Pennsylvania.

The difference between the methods in the majority of cases in those days and now is this: Those were the days of precedent; these are the days of intelligent design. This statement is true not only of railroad location, but of all branches of engineering work. It is true that to-day there is some work based purely on precedent, but the scales have tipped

From Trade to Profession—Advances In American Railroad Location.

By William G. Raymond.*

II.—The Qualities Looked for in an Engineer, and His Understanding of the Problem Involved.

Twenty to twenty-five years ago the main effort of the locating engineer was directed to getting a cheap line to sub-grade, with a maximum rate of grade and a minimum radius of curvature, fixed more or less arbitrarily from some precedent before the survey was begun. There was now and then an exception to this rule, but the writer has been an understrapper on many miles of western location made in accordance with this statement.

Then there were some men who appreciated the fact that the best line is that one that makes the greatest balance to the good between cost and return. Probably all had some dim notion of this truth, but all unformulated and not sufficiently clear in their minds to enable them to determine even roughly (which is the best we can do even now) any relation between operating expense and deep cuts or steep grades.

Then geometry, an "eye for country," and the ability to handle a party and "hustle," constituted the qualities looked for in the locating engineer by those proposing to build new lines. Then there were animated discussions as to whether or not it is a justifiable procedure to introduce a descending grade going up stream, if thereby some saving can be effected in earthwork. Then had the young assistant achieved a noteworthy advance when he had solved independently some difficult problem in compound curves. Then was the battle on between the engineer who located by trial in the field and him who located from a topographical map. Then could be heard the statement, uttered with great gravity by some member of a party, that if a flat place could be put into a long grade the "engine" could make the hill better or more certainly; and the statement would be received with more or less credulity by the different members of the party. Here was a glimmer of light on the now clearly understood virtual profile as distinguished from the actual profile. Then was the beginning of the stadia, said to be a wonderful device for measuring distances across rivers too wide to chain. Then were the days of courage and endurance and very little knowledge of the mechanical or economic principles involved in railroad location. Something was then known of the value of good drainage, but its absolute necessity was not by any means so well comprehended as now.

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the other way, and the balance is now in favor of intelligent design. In railroad location the results of the precedent method are always likely to be more disastrous, if the precedent be ill chosen, than in other engineering work, since the loss entailed, though possibly small at first, grows with the growth of traffic for ever. Probably the most remarkable example of scientific railroad location in later years is the Great Northern Railway, remarkable also for its general management.

Two great lessons have been learned in a quarter of a century. One is, that way-business is of great value, and that it is not a sacrifice, as is intimated in one text book, to go a little out of the direct course between termini, or principal centers, to serve some way town. The other lesson is: If the railroad does not go to the town or business, the town or business will not come to the railroad. There are perhaps sufficient exceptions to prove this rule.

A third lesson is the relative importance of securing business, reducing ruling grades, saving distance, rise and fall, and curvature. The order in decreasing importance is perhaps as here named, but there is a wide gap between the second and third items. Indeed, it is now well known that distance is not always an unmitigated evil, but may have its credit as well as its debit side.

Twenty-five years of railroad operation have brought better knowledge of the nature and division of operating expenses, and the proportion of these affected by possible differences in the character of the line.

A very considerable advance has been made in our knowledge of the nature and amount of train resistance, though there is still much room for work in this field. D. K. Clark's once universally accepted formula is now known to be much out of the way; but just what it is that uses up the power indicated by the locomotive cylinders is not yet fully understood. It has been shown that the resistance of the cars behind the tender will not account for it, and it seems to have been demonstrated that atmospheric head and side resistance will not account for it, while it is also maintained that the internal resistance of so simple a machine as a locomotive, added to both of the foregoing items, will not be sufficient to account for the indicated work at high speeds. Some properly conducted experiments are much needed.

The very recent advance of the operating department in rating locomotives on a tonnage instead of a car basis has made it possible to compare various ruling grades with a little more certainty than heretofore, while the actual deliberate operation of momentum grades and the rating of locomotives on this basis by more than one great road marks one of the most distinct advances in scientific as well as commercial railroading.

Twenty or more years ago a small percentage of the locating engineers were at all informed on the subjects just enumerated, and fully as small a percentage knew anything of the commercial side of railroading. Even the students in the better technical schools learned little beyond Henck or Trautwine, with now and then something about equal to Vose. Now the graduate of the technical school of high grade goes out to his work with a more or less thorough knowledge of the details of all of the subjects so generally mentioned in the foregoing paragraphs, and this knowledge constitutes his advance in mental equipment for the work of railroad location. He needs experience, but he can, nevertheless, unhampered by precedent, make a better general location than many a man more skilled in fitting the line to the ground. There is the same difference between this young graduate, able to intelligently design, and the man who fits the line to the ground, that there is between the young mechanical engineer and the skilled machinist.

The most important advance in instrumental equipment is the substitution of the complete transit or tachymeter, for the old plain transit. It is still unknown to many railroad engineers that good leveling can be done with a complete transit; that elevations may be determined by stadia methods with a precision amply sufficient for preliminary work, and with much less chance of accidental error than when the work is done by the slower method of rod and level.

So far as the writer knows, the first application of the transit and stadia to practical location work in this country was made about eight years ago on some difficult mountain location in the West, of which work he was in immediate charge. The impression made on his mind was so favorable that he has advocated the method, and has used it in every case in which it has seemed to be suitable.

A Test of a Peckham Truck.

We published last week a report of a test made at Peekskill, N. Y., of a Peckham "extra strong 14A" truck, built for the Chicago South Side Rapid Transit Co. That report was from notes made on the spot by our representative. Below will be found the official report to the Peckham Truck & Wheel Co., made by Robt. W. Hunt & Co.

"The side frames were placed in a horizontal position, opposite each other, in a wheel press, and braced apart at the spring seat with blocks of wood and iron. The load was applied at the center on the bars which supported the transoms, by means of the ram of the wheel press, and readings of deflection were taken at the center and at either end, in order to correct the deflection or lost motion in the wooden supports. Observations were also taken at the various points in the truck in order to note any movement of the different members.

"The following are the deflections, corrected for the compression of the wooden blocks, and represent the deflection and permanent set in one frame.

Load. Tons.	Total Deflection. Inches.	Permanent set. Inches.
5	.00	.00
10	.00	.00
15	.04	.00
20	.06	.00
25	.08	.00
30	.14	.06
35	.32	.20
40	.38	.26
45	.52	.34

50½ tons—At this point the lower tension member broke through the first rivet hole, and the malleable casting at one end. Fracture of steel bar showed crystalline.

"No distortion or movement of the various members was noted, except in the lower tension member, which, at a load of 45 tons, showed an elongation of 0.12" between the rivets in the connecting malleable castings."

The Johnson-Lundell Surface Contact for Railroads.

At the last meeting of the New York Electrical Society, Mr. Edward H. Johnson, Vice-President The Sprague Electric Company, described the surface contact system designed by Mr. Lundell and himself.

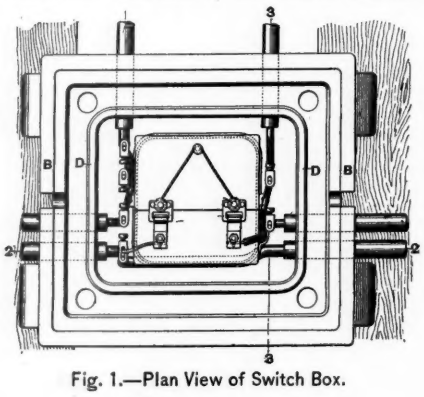


Fig. 1.—Plan View of Switch Box.

About three years ago this method of working was tried and reported as being successful. After an historical introduction, the author describes in detail the working of the apparatus from which the following has been prepared:

The switch, Fig. 1, is a plan view of the switch box in its position in the roadbed with the cover removed, so as to show its internal arrangements, the line, 2 2, being parallel with the roadway. Fig. 2 is a transverse section on the line, 3 3, Fig. 1. Fig. 3 is a vertical section through the body of the switch-inclosing box on the line, 4 4, of Fig. 4, which latter view shows a horizontal section of the same switch-inclosing box taken on the line, 5 5, of Fig. 4.

Referring to Figs. 1 and 2, B represents a rectangular cast-iron protecting box, as put between two ordinary cross ties. This box is cast in one piece with an upwardly extending inner flange, D running entirely around the interior of the box, and forms with the top or interior flange, a deep-seated groove, which may be termed a "mud groove." The cast-iron cover of the box, A, is provided with two downwardly extending flanges, F and G, the flange, F,

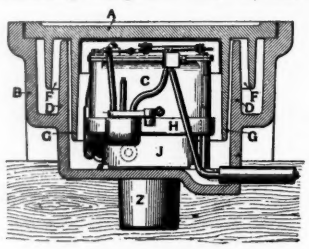


Fig. 2.

being arranged so as to extend a considerable distance into the mud groove as will be seen on examination of Fig. 2.

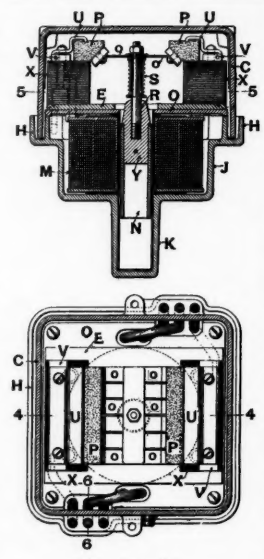
The flange, G, is somewhat longer than F, and extends to a point near the bottom of the box B, forming what may be termed a dividing bell for the protection of the fuse block and terminals shown in the figures referred to.

The inner surface of the cover or lid, A, is lined with insulating material for the purpose of preventing any possibility of the continuance of an arc when the fuse blows.

The Figs. 3 and 4 show the box which has two cup shaped parts, C and J, the lower part, J, being provided with an upper grooved extension, H, and a lower cylindrical extension, K, the arrangement being such that the lower edge of the upper portion, C, of the inclosing box will fit within the grooved portion, H. The lower portion, J, constitutes not only a part of the inclosing box, but is also intended to act mechanically as a part of the magnetic circuit of the electro-magnetic switch, O, being a cast or wrought-iron plate with an opening in its center and fastened to the grooved portion, H.

The lower part, J, of the inclosing box forms a chamber for the magnet that works the switch, which is of solenoid form, and is made up of two windings.

N is a hollow solenoid core of soft iron secured to an insulating standard, Y, which, in turn, is secured by a rod, R, to a series of yielding conducting arms, having fastened to their outer ends a series of good metallic conductors, the whole arrangement being such that when the solenoid core is in its lower position the metal contacts will rest on the upper surface of the insulating plate, E.



Figs. 3 and 4.

Blocks of insulating material are shown as N, and V represents blocks of conducting material secured to the same. Clamps for holding beveled shape blocks of carbon, P P, in position are shown as U, the arrangement being such that when the solenoid core, N, is held in its upper position under the influence of an energizing current, the working current will pass from the conductor joining one of the carbon blocks, P, to and through the contacts, o o o, to the remaining carbon block P and thence to the exposed sectional trolley conductor embedded in the roadbed in the manner well understood.

The cables leading to the switch boxes and to end of the magnet coils are bent downward in the side box L, as shown, and the cover, C, is placed thereon with its lower edge resting in the groove, H, after which this groove is filled with paraffin or any perferred sealing material, thus assuring the fact that all of the operative parts of the switch will be protected at all times and ready for use when they arrive at their destination, where they may be placed in the outer box, Z, as shown in Fig. 2, and the necessary connections made between the several conducting cables.

The Leak-Circuit.—The diagram, Fig. 5, shows the way in which the leakage currents are effectively guarded against. It will be noted that the coils which work the magnets are contained in a circuit leading from the track rails to sectional rails placed outside of the same. As the current which energizes the magnets flows in the direction from the sections of auxiliary rails to the track rails, any leakage from the conductors SC, SC³, SC⁵, etc., could not reach the outside sectional rails, and cause a current to flow from them to the track rails by way of the coils, all the leakage current necessarily being absorbed before it passes the negative track rails.

This diagram also shows the "by path" feature. It will be noticed that the current for the motors flows from the positive main through the switch-contacts to a sectional conductor, and contact shoe throuh the motors and to the controller where it divides itself—one part of the curent flowing by way

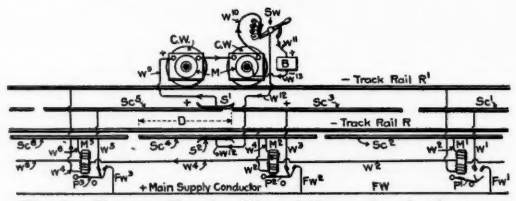


Fig. 5.—Diagram Showing Way of Preventing Leakage Currents.

of the negative contact shoe, and sectional rail to and through the switch coils and finally to the rails or the return conductor; the other part flowing through a storage battery of low voltage—charging the same—to the car-wheels and to the return conductor. It will thus be apparent that should the current through the motors diminish to any great extent, the current through the battery connection W^{11} will reverse and the battery will supply the additional current needed to safely work the electro-magnetic switches.

The Inter-Connecting Factor.—Experiments with the sectional rail system developed the necessity for a "time allowance" for working of the switches before taking current from the successive contact buttons or rails ahead of the car. Without such provision, a car running 10 or 12 miles per hour would "run away" from the current—that is to say, the car would pass over a button so quickly that its switch would not have time to act and, consequently, the motor current not only failed but destructive sparking at the switch contacts ensued. It is, of course, apparent that in the case of high speed trunk line roads this defect would be fatal. As to the efficiency of the means employed to give the requisite time allowance in a reliable and positive way, it

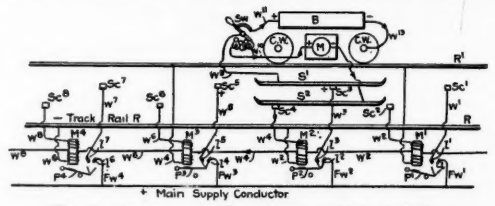


Fig. 6.—Interconnections Between Switch Coils.

needs only that the fact be stated that the current employed for actuating any given magnet is carried forward to and utilized in actuating the next succeeding one. If, therefore, the current employed is sufficient to energize the first, it must of necessity be

sufficient for the next, thus ensuring the operating simultaneously with the first and not at some indefinite period thereafter. The diagram, Fig. 6, shows the manner of interconnections between the operating switch coils. The current will flow from sectional conductor SC^4 through wire W^4, through upper coil of magnet M^2, then by the interconnecting wire W^4 around the lower coil of magnet M^3 to track rail.

In both Figs 5 and 6, the shoes are shown as S^1 and S^2. A study of these diagrams should show clearly the method of connections and the contacts, as also the circuits in both cases.

The author then discusses some of the essential parts of the system, stating the manner of overcoming the difficulties encountered. Among other devices, a crossing protector is provided to act as a safeguard in crossing the tracks of another line. An alternative system in which the track rails and earth need not be employed as conductors is also explained. It has been the aim of the inventors to make this system apply equally well to steam railroad service as to street railroads.

American Society of Mechanical Engineers.

The nineteenth annual meeting of the American Society was held this week in New York. The opening session was on Tuesday evening, when Mr. Charles Wallace Hunt, the retiring President, delivered an address, a few extracts from which follow.

At the session, Wednesday morning, reports of the standing committees were presented and discussed, among which were committees on Uniform Testing of Material and on Uniform Testing of Engines. The election of the following officers was announced: President, George W. Melville, Chief Engineer U. S. Navy; Treasurer, William H. Wiley; Secretary, Prof. F. R. Hutton; Vice-Presidents, E. D. Meyer, B. H. Warren and George P. Stetson; Managers, A. N. Goodale, E. C. Felton and M. W. Sewall.

The new discoveries of materials, forces and laws which now succeed each other so rapidly, make a corresponding increase of the responsibility and changes in the practice of engineering. That we live in a world of changes is at once our opportunity and our pleasure. Some of these burst upon us and attract universal notice, while others come so slowly that they are almost unobserved. A change of the latter character has been taking place of late years in the work required of professional engineers. This has largely come from the development of our manufacturing institutions from the position of being a minor factor in our economic life, to being one of great importance, not only in numbers, but in individual magnitude, and the necessary employment of skilled engineers to conduct their technical affairs.

The engineer of the user and the engineer of the maker have widely different duties. Consider how different may be the information required in practice by two classmates, whom we will designate as "A" and "B," who graduate from college as engineers. "A" secures a position in the engineering department of a city, and commences his work, which may be the designing of a new water pumping station. His college course has fitted him for the work. His textbooks were suited to problems of this character. He finds abundant information on all branches of the subject in data published in the proceedings of scientific societies, in technical literature, and in Annual Reports of city departments. The forms of contracts to be entered into are at hand, all found elaborately drawn, with every point safeguarded, and need only a little selection and adaptation to suit his case. They place in his hands the power to decide absolutely and without appeal all questions which may arise in carrying out the work.

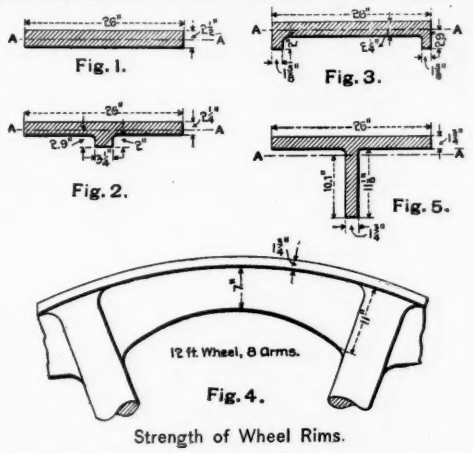
"B" obtains employment in the engineering department of a manufacturing corporation, which in due time estimates and submits tenders for the pumping plant for which "A" has issued specifications. He will find that the form of contract proposed by "A" has many minute and carefully worded clauses to bind and limit the supplier. The tender to be submitted for the work must in its scope and wording protect the interests which "B" represents not only in a general sense, but in every one of the clauses of the proposed contract. Every obscure phrase and every adjective used by "A" must have definite consideration and be clearly defined in both an engineering and a legal sense. "B" here finds that the information derived from his college course is largely inapplicable, and there is no technical literature which he can use, either as a general guide for making a form of tender or the proper expressions to use to define or limit the obscure clauses or words found in the specification.

Looking at the subject from a purely technical point of view, we see quite as great a variation in their work. "A" would require only a general knowledge, while "B" would require the most thorough and exhaustive information of the qualities of constructive materials, and shop practice available in that particular location. The further we carry the comparison of their work, the more clearly it is seen that the educational requirements are becoming more complex to correspond with the growing specialization of engineering work.

There is another phase in engineering practice represented by the duties of "A" and "B" which now becomes interesting if the work of American engineers is to take the place in the world at large to which the indications now so plainly point. In other countries it is a common practice for "A" to make all the general designs and all of the details, and the supplier has no responsibility either for the design or for the efficient working of the plant when completed. If errors or omissions are found in the drawings or specifications, the cost of the changes required is paid by the purchaser, in the usual bill for extra work. In this case the duties of "B" are small or disappear altogether.

The American practice is tending to the method of making the requirements issued by "A" of a general character, which will cover the results sought, and leave to the supplier, "B," the work of designing the particular means to accomplish the desired end. Business has become of such a magnitude and so complex that one mind cannot fully grasp, and readily handle, the new discoveries, new materials and new practices, which now come so rapidly. For efficient and economical results, each phase must be handled by an expert. There will be many "B" engineers to respond to the requirements of "A," and each will present for consideration different ideas, different materials and different shop practices. "A" must select from these various plans and details submitted the one which best promises to fulfill the requirements. It is a division of labor between "A" and "B," each of whom, by tastes and training, is especially fitted for his part of the work. We may paraphrase their duties by saying that "A" is a judge, "B" is a counselor.

The life of the engineer has a full measure of the labors, the trials, the discomforts, and the disappointments which are found in this, as in every other walk of life. But it also has the successes which come from well-directed labors. It is not, however, either the useful work or the successes of life which bring happiness. It is man's ideals which make him happy. Let us together survey some of the surrounding influences which tend to give high ideals of life to the engineer, no matter what the vexations of the moment may be. We will pass in review the interesting character of his daily work, his pure-minded associates, the fascinating scenes, and the higher pleasures of life by which he is surrounded. We will then better appreciate with what elevated emotions a father can lead a son, or a teacher his pupil, to the path of an engineering life, and place in his hands the mathematical, chemical, and physical implements to enter upon a work which will



Strength of Wheel Rims.

bring him both pleasure and honor. Whichever way engineering may develop as time rolls on, its elevating influences are constantly at work on the mind and on the character. The work is carried on under unchangeable laws, which must be rigorously applied and adhered to, or failure is sure to result.

The effect of living and working in such a sphere of action, where it is inconceivable that an engineer could knowingly be otherwise than exact in his work, should tend to influence the whole trend of his life and character, and make them to a greater or less degree a reflex of his daily work. He of all men has the most unchangeable and exalted basis for his ethics.

Abstracts of two of the papers presented are given below. Others will be prepared for a later issue, with notes on the discussions at the different sessions, the programme for which was printed last week, page 851.

Note on Strength of Wheel Rims.—By Albert K. Mansfield.

On page 5 of Mr. Supplee's translation of Reuleaux's "Constructeur" occur these words: "It is upon this point that the peculiar strengthening effect of ribs depends, and which makes their use so advantageous in cast-iron construction." Then illustrations follow to support the fact that ribbed construction increases strength, that is, is economical of material; but it is not shown there, nor elsewhere to the writer's knowledge, that this is not universally the case, but that the exact contrary may be the fact.

This may best be pointed out by a practical illustration: The moment of resistance of the rectangular section of Fig. 1 is $\frac{1}{6} b h^2 = (26 \times 2\frac{1}{4}^2) = 27.07$, AA being the neutral axis.

Now let one-fourth inch of the thickness of this section be formed into a rib 3¼ in. thick, as shown by Fig. 2. Preserving the same total area as before, this rib becomes 2 in. deep, making the total depth of the section 4¼ in. The neutral axis will be found to be located as shown in the figure, and from a well-known formula the moment of resistance is found to be 18.64; that is, the least moment of resistance, or the moment of inertia divided by the greatest distance of fibre from the neutral axis.

The section has, therefore, been weakened by the ribs; in fact, unless it represents the special case of a cast-iron beam loaded so that the extreme fibre is subjected to compression, it is only about two-thirds as strong as before. It is seen, therefore, that under some conditions ribbing does not have a strengthening effect. It would clearly be useful to generalize this matter in such a way as to make it easy for the designer to determine when and to what extent ribbing may or may not be resorted to with advantage, but that is beyond the purpose of the present writing.

If we separate the rib of Fig. 2 into two ribs and place them at the ends of the section as in Fig. 3, we have, without change of strength, a section similar to that often used in the construction of wheel rims. The bending moment of such rims, due to centrifugal force, acts with maximum effect near the wheel arms, in such way as to cause tension at the extreme fibre. It will be clear, therefore, that such ribs in such place may make the wheel weaker than it would be if they were not employed. It is not meant that wheels cannot be ribbed in this manner to their advantage, but rather that it is necessary to take care that they are not thus ribbed to their disadvantage. There are many wheels in service which have been strengthened in this negative way.

The destructive accidents which have occurred to large wheels have led to bringing cast-iron into disrepute as a material from which to construct such wheels. This fact, coupled with that pointed out above relative to rim-flanges, has led the present writer to the use of the method of ribbing wheels illustrated in Fig. 4, which seems to fill all requirements, enabling cast-iron rims to be made as strong as may be practically desired.

Maintaining the same face of wheel and total area of section as before, let us employ ¾ in. of the thickness of rim in forming a rib 1¾ in. thick at center of rim; the section then becomes as shown by Fig. 5. The neutral axis of this section is at line AA, and the moment of resistance becomes 77.5, which is nearly three times as strong as the section of Fig. 1, and more than four times as strong as the flanged section of Fig. 3. Of course, a further increase of strength may be obtained by adding to depth of flange.

The Theory of the Moment of Inertia. By C. V. Kerr.

The writer presented a paper on this subject a few years ago, and at that time the members of the Society who took part in the discussion did not seem to be in sympathy with the evident purpose of the author to attempt to give a physical conception of the moment of inertia. In this paper the author reviews some of the more important considerations, the principles of which are summarized as follows:

(1) That mass may be used as a measure of force causing unit acceleration in unit time.

(2) That momentum is not merely a "quantity of motion," but a measure of the inertia developed in a body.

(3) That the moment of inertia of a body depends upon acceleration as well as upon mass, and is expressed as the moment of a force in inch or foot pounds.

(4) That the centers of oscillation and of percussion are not always identical.

(5) That in this, the concrete form, the moment of inertia is a question of dynamics, as opposed to the moment of resistance, which is a question of statics.

(6) That the analytical and graphical methods evolved are either singly or in combination capable of effecting a solution of any useful problem.

(7) That the concrete form of theory permits the designation of a numerical result in rational terms.

A High Speed Electric Locomotive in France.

Since the end of 1897 the Paris, Lyons & Mediterranean Railroad has been trying on its main line, between Paris and Melun, a high speed electric locomotive. A description of the engine and of some of the experience with it is published in the Revue Générale des Chemins de Fer of November. This engine has about one-half the power of the ordinary express locomotive of the company, but its power is exerted through two axles only, and by increasing the number of axles without changing the type of the machine its power can be added to as may be desired. The engine is supplied with electric current from a storage battery, which is hauled behind in a special vehicle. In consequence, a great part of the power developed is absorbed in hauling this heavy tender; but the storage battery could be done away with, of course, by taking current from a conductor, and therefore, the observations made are of the same value for experimental purposes as if the current had been so supplied; that is, the use of the storage battery has been merely an expedient to simplify the investigation.

This locomotive, designated as "E-1," is mounted on three axles, two of which are driving axles, and all the wheels are of the same diameter, namely, 1.1 meter. The forward axle is simply a carrier; the second and third, or driving axles, are not coupled, each carrying its own motor. The locomotive proper carries, besides the motive machinery, an electric air compressor, to supply the Westinghouse brake, and also a number of cells of storage battery. The current supplied by these cells serves an exciter and compressor, to supply the Westinghouse brake and power for lighting and is sufficient to move the locomotive at a speed of three to six kilometers an hour. The total weight of the locomotive itself is 44,500 kilograms. The tender, carrying the storage battery, weighs 45,800 kilograms, most of this being, of course, the weight of the accumulator cells.

Many journeys have been made with this locomotive, first between Paris and Brunoy, then between Paris and Melun. The maximum load hauled going and coming so far has been 147 tons, including the tender, but not the locomotive itself, and with this load the engine has made a mean speed of 45 kilometers an hour. Extreme speeds on a moderate down grade have reached 100 kilometers an hour with a load of 100 tons hauled. Experiments made so far have been intended only to watch the working of the various mechanical and electrical parts of the locomotive and to ascertain the limit of the power of the battery. They will soon be followed by other experiments, designed to show the efficiency, economy, etc., of the apparatus.

The cable road on Vesuvius has its foot 2,600 ft. above the sea, which is two-thirds of the height of the summit, and passengers have a long carriage drive to make in order to reach it. Recently a contract has been let to Färber & Co., of Coire, Switzerland, to build a narrow-gage railroad from Naples to the foot of the present Vesuvian Railroad.

RAILROAD GAZETTE

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EDITORIAL ANNOUNCEMENTS.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussion of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially either for money or in consideration of advertising patronage.*

The railroad situation in China is by no means clear. By our last letters we learn that the agreement for railroad and mines loans to apply to the extension of the Imperial Railways of North China to New Chwang and to the collieries near Kin Chow was signed at Peking Oct. 10. We have not learned, however, whether or not this has been ratified by the emperor, or rather by the empress dowager. The emperor has practically abdicated and at present the empress dowager and her followers or advisers are in power and their policy is openly anti-foreign and hostile to railroad and mining enterprises. Therefore, even if the agreements for loans are ratified it does not follow that they can be put on the markets in the present disturbed condition. It is pretty evident that we cannot hope for any steady and large development of railroad enterprise in China until that country has a safer government, and it is further evident that she cannot have a safer government until an end is put to the activities of Russia in pushing forward her plans for the breaking up, if not the absorption, of the empire.

Locomotive Boiler Tests.

The error introduced into the coal measurements of locomotive boiler tests by starting and stopping is discussed in a paper by Mr. Howard H. Maxfield, extracts from which were given in our issue of November 4. It is shown that where the locomotives tested are used in fast express service and the runs are comparatively short, the error in the coal record, as road tests are usually conducted, may be as much as 10 per cent.; and by starting and finishing the test with a small banked fire in the roundhouse, the error need not exceed 1 per cent. This is interesting chiefly in view of the fact that the error by the usual method results in a too favorable showing for the boiler. But a locomotive road test at the best cannot be relied upon to give comparable data as to the performance of boilers, because of the ever changing conditions while on the road; the locomotive testing plant really offers the only means for obtaining such information.

To be explicit, we can do no better than to quote from an excellent paper by Mr. F. G. Gasche, Mechanical Engineer of the Illinois Steel Works, which was read before the Western Society of Engineers in July of last year. Mr. Gasche said: "It is important to observe in this line of experimental work that a boiler trial is essentially a measure of rates. The ultimate result depends on the rate of delivery of the feed water, the rate of coal consumption, and the rate of ejection of moisture with the steam. The first requisite for the measurement of these rates is to maintain constant the conditions upon which the operation of the boiler depends; meaning, among other things, that the demands for steam from a boiler under test must be maintained as nearly uniform as it is possible to make them." It should be remembered that the writer had in mind only tests of stationary boilers, in which these conditions can be fairly well controlled, yet he has found that there is little uniformity in the results of such boiler trials made in the past, because the influence of the rate of combustion has not been generally recognized by those conducting the tests. In service tests of locomotive boilers the final results can be no more than a combination of a great number of widely varying results, due to unknown, changing conditions, which can neither be controlled nor reproduced. Such tests can never have great scientific value, and it is doubtful if it is safe to depend upon them for more than rough estimating, and then much discretion has to be used.

On the other hand, we were impressed a short time ago by the satisfactory and conclusive nature of data regarding boiler performance, as obtained in the locomotive laboratory at Purdue. Extensive boiler trials had been made with several kinds of coal to determine their relative value, and the plotted results gave lines of remarkable consistency, in marked distinction to the usual wide zones in which similar results from road tests have been found to lie. Unfortunately these tests will probably not be made public, but if published the general uniformity of the results and the immediate effect that a slight change of the conditions brings about would undoubtedly give many a better understanding of how unreliable must be the results obtained in service tests.

Ticket Brokerage.

The New York state anti-scalper law has been killed by the Court of Appeals, and ticket brokerage is now legal. Honest brokerage being lawful, the cities of New York, Albany and Buffalo will be "wide open" for the dishonest practices which have always flourished among this class of alleged public benefactors. The decision of the court, as reported in the daily papers, is given on another page of this issue. Judge Parker's opinion overrules the contrary opinions of eight other justices (in the Supreme Court and the Court of Appeals.)

His view is based largely on the assumption that ticket brokerage is not wholly prohibited by the Act under discussion. The law provides that an agent, say of the Chicago, Rock Island & Pacific in New York City, selling a ticket to Denver over his own road, may go to the office of the New York Central, a few doors from his own, and buy a ticket from New York to Chicago, to be immediately resold to his passenger. Judge Parker holds this provision to be such a serious weakness as to vitiate the claim that the law places the sale of tickets wholly in the hands of authorized agents of the companies. Assuming, therefore, that the law, while severe on the brokers, makes an exception for the benefit of railroad ticket agents, he evidently looks upon the whole statute as conceived in a spirit of persecution. Of course every one conversant with the business, whether railroad man or broker, knows that transactions such as that which we have cited are not brokerage, or speculation, or anything of the sort. The law requires the purchase to be made from an authorized agent of the railroad issuing the ticket, and the buying agent can lawfully buy only to the nearest point on his own road. He cannot buy and sell tickets for places all over the United States, as the judge seems to think. He cannot speculate or make a profit, for he must pay the regular rate, and he cannot sell above that rate.

Judge Parker looks upon tickets as simple property, the same as a horse or a watch, and therefore fully negotiable; and he argues at considerable length concerning the right of the citizen to buy and sell them. In this the views of Judge Patterson (in the lower court) and the opinion of the Supreme Court of Minnesota in the Corbett case (59 N. W., 317) are not even mentioned, so far as we can discover from the reports before us. The Minnesota court said:

> While the railroad ticket is, in one sense, "property," yet it is not merchandise or chattel. It is merely the evidence of the contract of the carrier to transport the holder between the points and on conditions therin named. Treating it as a contract itself, it is in the nature of a chose in action. No one with whom the carrier makes such a contract has any inherent constitutional right to insist that it should be assignable. At common law all choses in action are non-assignable, and if the Legislature had deemed it necessary, in order to prevent the supposed evils, to provide that all transportation tickets should be non-transferable, or even to prohibit the issue of tickets altogether, and require carriers of passengers to collect fare in cash, we fail to see why they had not the power to do so.

Probably the strongest point in Judge Parker's decision, from a narrow judicial point of view, is the argument that if a broker sells a valid ticket no fraud can result, while if the ticket is fraudulent the crime may be suitably punished under other statutes. This is all right theoretically, but practically it amounts to nothing at all. Railroads cannot detect fraudulent tickets on sight, and consequently the culprit, or the witnesses against him, will get out of reach before the crime is known. Again, much of the business which brokers call legitimate is really fraudulent, only a railroad is party to the fraud. Reputable railroads ask for the law to enable them to stop tricks of this kind. A broker handling a ticket marked "not transferable" is prima facie committing a fraud. The selling railroad may wink at the fraud and the second railroad may be unable to detect it; but the business is crooked, nevertheless, and ought to be stopped.

This decision will be likely to put a serious damper on the movement to secure a Federal law prohibiting brokerage in tickets. There are, however, a number of differences between the New York statute and that which Congress is asked to pass. The New York law was more carefully drawn, and it provides for the punishment of a railroad which does not comply with its regulations, a feature which does not appear in the Federal bill, and the absence of which has been complained of by the brokers. This clause ought to be added to the Federal bill. Again, the Federal law permits one sale by a passenger; that is, a passenger may sell his ticket to a second person who intends to use it himself. This is a concession to the opponents of the law which, it seems to us, may turn out to be a fatal weakness, or nearly that. If the fight is to be kept up the bill may as well be made as strong as precise language can make it. A law, once passed, cannot be easily amended, except after long delay, and Congress cannot afford to compromise with the brokers. If scalping is to be stopped, every irregular transaction in tickets must be forbidden; and the railroads will have to make regular transactions so convenient and satisfactory to the public, and redemption of unused tickets so prompt and easy, as to shut off all reasonable complaints.

Law or no law, there can be no question what the public interest requires. Brokerage in tickets favors the few (passengers) at the expense of the many, favors unprincipled passenger officials at the expense of those who desire to act on principle, and affords convenient "fences" for stolen tickets. All the strong railroads desire the suppression of ticket brokerage. It is probably fair to say that all reputable railroads desire it. Railroads which wish to let their general passenger agents (in hard times) sell tickets through brokers can generally be classed as disreputable, although, theoretically, such transactions may be classed as not dishonorable. At any rate, those roads which do not want legislative regulation, if such there be, have not actively opposed those who are working for it. The desire of the railroads to suppress ticket brokerage, for the purpose of thwarting the schemes of dishonest conductors, may be a minor argument, and the courts probably look upon this feature as relatively unimportant; but it really is a vital element in the proposed reform. On the same principle that, undoubtedly, the best good of the community would be conserved by shutting up four-fifths of all the pawnbrokers' shops, closing a similar percentage of the ticket brokers' offices would promote honest dealing and harm no one. Fraudulent tickets cannot be detected by the honest conductor in every case; probably in only a small percentage of cases, for the reason that he has to work in a hurry, often by poor light; and dishonest conductors cannot be detected by their employers until after long investigation.

In all discussions of this subject, judicial or otherwise, the honest and the dishonest broker are cited and contrasted. The dishonest broker certainly deserves no defense. In this connection it should be said that nearly or quite every prominent ticket broker in the country has been accused of sharp practice, generally with a good deal of presumptive evidence to support the accusation and sometimes with strong proof. In view of the common use of the non-transferable clause on tickets which the scalpers say are their legitimate prey (such as $5 round-trip tickets, where the one-way rate is $3), we may fairly say that all ticket brokerage requires something very like sharp practice, even where the selling road approves it; and those brokers most inclined to be honest feel the most uncomfortable in the business. This being so, the sharpest individuals make the most money and become the most prominent. It is, therefore, not a surprising result that the men best known in this business should be best known on the police court records, for as they become bold by experience, and acquire some little wealth, they take greater risks. Mr. Daniels, in his testimony before the committee of Congress at

Washington, gave a list of several hundred brokers all over the United States, and distinctly charged that everyone of them had been guilty of illegal practices.

Many people besides Mr. Daniels believe that the honest broker is a myth; but however mythical this personage may be, our sense of justice compels all reasonable attention to his so-called claims. The representative of the brokers, who appeared before Congress last winter, said that the brokers got about 95 per cent. of their tickets from the railroad companies. There is no need of allowing the continuation of the brokerage business for the benefit of these railroads, for according to every consideration of right they ought to be made to sell their tickets openly. Only in that way can they render a reasonable compliance with the law requiring stable and public rates. If only 5 per cent. of the brokerage business comes from passengers whose rights are such an important element in the question when it comes before a court, the argument for the maintenance of brokers' offices becomes almost ridiculous. On the other hand, the railroads which ask for a law, not only desire to reach such of the brokers' patrons as are dishonest, but they also want to reach the railroads which sell the alleged 95 per cent. of tickets. There can be no question that the spirit of the law which requires passenger fares, as well as other railroad rates, to be public, uniform and stable, is violated by every sale of a ticket at a discount through a broker, and the few passengers who do supposably get some benefit from the existence of brokers' offices secure that benefit at the expense of a practical violation of the law.

Supposing a broker does lawfully get a lot of return portions of excursion tickets, is that a good business for the public—that is, the Government—to foster? If round-trip tickets at a price less than the cost of two single-trip tickets are legitimate they ought to be non-transferable. If the railroad company deliberately winks at violations of its own restrictions, the interest of the public in equal rates to all passengers should warrant the Legislature in making a law to suppress such violations, by whomsoever committed. The alleged profits of a few brokers are not to be compared with the pecuniary interest of the public.

Mr. Depew tells a reporter that the railroads will probably give up the fight in New York state. This is not by any means the only course that can be pursued, for Judge Parker himself hints that a law could be drafted which would meet his approval. He intimates that the state could prescribe the moral character requisite in a ticket broker. It is true that the candidate could reply, as did the rum-seller, that no moral character was necessary for such a business; but it would not be impossible to frame a workable law. The question, however, is, whether anyone is ready and willing to work it—that is, get it enforced. The chief reason for accepting Mr. Depew's opinion as indicating the true course to pursue, is that so many railroads have been lukewarm in the matter. A few general passenger agents have done all the real work in agitating public opinion. The railroads cannot depend on state's attorneys to punish violators of an anti-scalping law; they must themselves detect offenders. And they are not likely to do much at this unless a number of them act heartily together. But the need of action is as serious as ever, for reports of passengers being cheated by scalpers are to be found in the newspapers every week. If the "liberty of the citizen" to engage in this business is to be upheld to the full extent indicated by Judge Parker's decision, the task of securing punishment for dishonest dealings will be uphill work indeed.

October Accidents.

Our record of train accidents in October, given in this number, includes 111 collisions, 105 derailments and one other accident, a total of 217 accidents, in which 45 persons were killed and 110 injured. The detailed list, printed on another page, contains accounts only of the more important of these accidents. All which caused no deaths or injuries to persons are omitted, except where the circumstances of the accident as reported make it of special interest.

These accidents are classified as follows:

COLLISIONS.	Rear.	Butting.	Crossing and other.	Total.
Trains breaking in two	19	0	1	20
Misplaced switch	4	1	2	7
Failure to give or observe signal	2	3	5	10
Mistake in giving or understanding orders	1	4	0	5
Miscellaneous	15	3	16	34
Unexplained	13	9	13	35
Total	54	20	37	111

DERAILMENTS.			
Broken rail	2	Unfastened switch	1
Loose or spread rail	1	Open draw	1
Defective bridge	2	Derailing switch	1
Defective switch	3	Bad loading	1
Broken wheel	1	Animals on track	1
Broken axle	8	Landslide	2
Broken truck	3	Sand drift	1
Fallen brakebeam	1	Maliciously mispl'ced switch	1
Failure of drawbar	2	Accidental obstruction	1
Misplaced switch	7	Unexplained	63
Track repairers	1		105
Bad switching	1		

OTHER ACCIDENTS.	
Boiler explosion	1
Total number of accidents	217

A general classification shows:

	Collisions.	Derailments.	Other accid's.	Total.	P. c.
Defects of road	0	8	0	8	4
Defects of equipment	20	15	1	36	16
Negligence in operating	56	13	0	69	32
Unforeseen obstructions	0	6	0	6	3
Unexplained	35	63	0	98	45
Total	111	105	1	217	100

The number of trains involved is as follows:

	Collisions.	Derailments.	Other accid's.	Total.
Passenger	32	14	0	46
Freight and other	163	91	1	255
Total	195	105	1	301

The casualties may be divided as follows:

Killed:	Collisions.	Derailments.	Other accid's.	Total.
Employees	23	6	4	33
Passengers	0	1	0	1
Others	10	1	0	11
Total	33	8	4	45
Injured:				
Employees	65	22	0	87
Passengers	13	2	0	15
Others	6	2	0	8
Total	84	26	0	110

The casualties to passengers and employees, when divided according to classes of causes, appear as follows:

	Pass. Killed.	Pass. Injured.	Emp. Killed.	Emp. Injured.
Defects of road	1	1	2	5
Defects of equipment	0	1	4	0
Negligence in operating	0	13	23	65
Unforeseen obstructions and maliciousness	0	0	2	6
Unexplained	0	0	2	11
Total	1	15	33	87

Twenty-seven accidents caused the death of one or more persons each, and 38 caused injury but not death, leaving 152 (70 per cent. of the whole) which caused no personal injury deemed worthy of record.

The comparison with September of the previous five years shows:

	1898.	1897.	1896.	1895.	1894.	1893.
Collisions	111	91	72	60	92	132
Derailments	105	68	62	64	81	116
Other accidents	1	6	7	7	9	12
Total accidents	217	165	141	131	182	260
Employees killed	33	25	27	40	25	45
Others killed	12	29	22	9	19	52
Employees injured	87	65	55	73	107	140
Others injured	23	51	34	100	102	188
Passenger trains involved	46	36	48	40	65	99
Average per day:						
Accidents	7.00	5.32	4.55	4.19	5.87	8.39
Killed	1.45	1.74	1.58	1.52	1.42	3.13
Injured	3.55	3.74	2.87	4.94	6.74	10.58
Average per accident:						
Killed	0.21	0.33	0.35	0.36	0.24	0.37
Injured	0.51	0.70	0.63	1.18	1.14	1.26

The number of accidents reported this month is large, reflecting the very active traffic on railroads in every part of the country. The record of deaths and injuries to persons has not, however, increased in such large proportion. The number of accidents attended by unusual circumstances was not so large as it generally is. One of the most notable derailments was the drawbridge accident of the 25th, which, it will be noted, was not in the wild West, but on one of the busiest railroads of the East and within a few miles of New York City. In the collision at Maywood, Ill., on the 10th, we have the unusual circumstance of an automatic signal giving a wrong indication because it had been tampered with by unauthorized persons; or, at any rate, officers of the road believe this to be the explanation.

We have again to report a disastrous locomotive boiler explosion, killing four trainmen. We have had to report disasters under this head every month this year, except in February and April, and the total number, 14, is already larger than that for the whole year 1897.

The killing of an engineman in the cab while his train, a night express, was running at full speed, and the subsequent running of the train about 10 miles with no one at the throttle, has already been reported in the Railroad Gazette. (Nov. 4, p. 801.)

On the Canadian Pacific, near Fort William, on the 31st, a train carrying soldiers was derailed and two of the soldiers were killed. On the Monterey & Mexican Gulf, in Mexico, on the 14th, there was a butting collision in which a mail agent was killed.

The number of electric car accidents in the United States in October, according to the reports which we have gathered, was nine, in which 13 persons were injured. Five of these accidents were collisions at crossings in cities.

Disputes between railroads and cities concerning the use of grade crossings occur now and then even in England, a country in which we are apt to imagine that every street runs above or below the grade of the railroad. The County Council of Warwickshire has lately brought action in court to compel the London & North Western to reduce to four miles an hour the speed of all its trains crossing a certain street at Atherstone, and the Queen's Bench Division of the High Court has sustained a decision in favor of the Council. This place is on the main line, 20 miles north of Rugby. According to an account in Herapath's the gates at the crossing are shut, between 6 a. m. and 6 p. m., an aggregate of five hours. The gates are interlocked with the block signals, so that they must always be closed before a train is allowed to enter the section of track in which they are situated. As Herapath's observes, both parties will be punished by the decision; the trains will be delayed and the gates will be kept shut longer than before. There are 120 trains during the 24 hours. If trains pass during the 12 hours ending at 6 p. m. at average intervals of 10 minutes, the total number in that time would be 72, and to close the gates 300 minutes each train would have to hold them an average of 4 minutes 10 seconds. American cities would make a pretty big row over a delay half as long as that. If the railroads conform to the four-miles-an-hour regulation and also continue to close the gates when approaching trains are a mile or two distant they will outdo themselves in cautiousness, and Mr. Loree will have one more argument with which to prove that the English people protect the lives of travelers more thoroughly than they can really afford to.

A November Snow Storm.

New York City and vicinity and the Atlantic Coast from New York to Maine were visited on Saturday and Sunday last by the worst snowstorm that has occurred in that territory since March 12, 1888, and the worst one that has occurred in November since 1870. The depth of snow in New York City and Philadelphia was about 10 in., at New Haven 16 in., and at New London 18 in., and there were drifts everywhere. The storm was accompanied by high wind and 25 or 30 vessels were blown ashore in and near Boston Harbor, and probably about 30 persons lost their lives in these wrecks. The sidewheel steamer Portland, which started from Boston to Portland, Me., Saturday night, went ashore off Highland Light, Cape Cod, and was wrecked and lost, with every passenger, all the officers and the entire crew, about 150 persons in all.

The worst railroad blockade was on the New York, New Haven & Hartford, between New Haven and Providence, the tracks in the vicinity of New London having been blocked early Saturday night. At Saybrook there was a derailment of freight cars, which delayed trains so seriously as to practically thwart the efforts of the company to keep the road open. The trains leaving Boston and New York Saturday night did not get through until Monday afternoon. Reports state that through trains were held at New London on Sunday because the block signals could not be worked, and there was no telegraphic communication from one station to another. The New York and Boston route by way of Hartford and Springfield was also blocked, but was opened by Monday forenoon. West of Bridgeport, Conn., drifts 16 ft. deep covered the track for 80 rods. Near Rye, N. Y., a dozen telegraph poles fell across the tracks. Only a few trains were run on the New York division on Sunday, and these made slow progress. Trains to and from the Grand Central Station, New York, were considerably delayed in the yards. Trains on the New York Central were badly delayed south of Poughkeepsie, but the track was practically cleared by Monday morning. Near Tarrytown a short section of the track nearest the Hudson River was damaged by the high tide and wreckage and could not be used.

The Long Island Railroad had deep snow on all of its numerous lines, and trains on the divisions nearest New York, where the passenger traffic is ordinarily very heavy, were almost completely tied up throughout Sunday, and trains ran with difficulty Monday. On Monday evening a snow plow was derailed in a drift near Jamaica, and the engines pushing it were ditched; the conductor was killed and one engineman and one fireman were injured. The officers of the road found it impossible to hire extra shovelers, even at $2.50 a day. The telegraph wires were broken down so that no reports were received from the eastern end of Long Island until Monday. The Port Jefferson branch had not been opened Tuesday night.

The snow in the northern part of New Jersey was nearly as heavy as in New York, and trains were stalled many hours in drifts on the Lehigh Valley road.

On Sunday afternoon a snow plow of the Boston & Maine was derailed near South Berwick, Me., and the engineman and fireman were killed.

In New York City and Brooklyn the electric and the horse car lines in particular, suffered from the effects of the storm. The electric roads of Brooklyn, within the city limits, were not entirely disabled, but the service during Sunday on most of the lines was practically suspended. The Third Avenue and the Broadway cable lines (Borough of Manhattan) ran with fair regularity throughout the storm. At five o'clock

Monday morning practically all of the lines worked by the Metropolitan Street Railway Company were running on schedule time, except in a few cases where the tracks were blocked by snow. It appears that one of the difficulties met with in the electric conduit roads was the inability of the companies to use the sweepers, but this occurred also on some of the overhead electric lines in the neighboring cities. As far as can be learned, the electric conduit was not obstructed by snow, nor was the use of the contact rails at all interrupted by frost or ice.

In Jersey City, Newark and other cities near New York, the electric lines were blocked for some time. A car on one of the lines of the New Jersey Traction Company came to a standstill in a snowdrift in Delawanna and remained there for many hours. A car under similar conditions remained in a drift near Bensonhurst (Brooklyn) for about 12 hours, and other cases of similar serious blockades were common. Those lines that could keep their sweepers working during the storm were able to run with fair regularity.

TECHNICAL.

Manufacturing and Business.

The engine forgings and shafting for the torpedo boat Davis, which was built at the Wolf & Zwicker Iron Works, Portland, Ore., and which on trial trip made an average speed of 23½ knots an hour, being one knot more than contract speed (the revolutions averaging 382), were made by the Bethlehem Iron Company, South Bethlehem, Pa.

Armour & Co., Chicago, Ill., is introducing electricity into its plant and expects to install the machinery with its own force. The company states that all purchases have been made.

The New Haven Steamboat Company has placed a contract with the Maryland Steel Co. for building a steamer.

Articles of incorporation have been filed by the American Engineering Co. The objects of the company are to equip and maintain electric light plants. The capital is $100,000, the amount paid in being $1,000. The incorporators are Samuel B. Vrooman, Nathan Cox and John B. MacAfee, of Philadelphia, and John H. Tunstall of Camden.

The Cleveland Twist Drill Co., Cleveland, O., has been awarded the gold medal at the Trans-Mississippi & International Exposition held at Omaha.

The Falls Hollow Staybolt Co. has received an order for a carload of safety hollow staybolts from one of the largest manufacturers of steam boilers on the Lakes.

The Department of Water Supply, City of New York, will receive bids at room 1704, 150 Nassau street, New York, until Dec. 8 for furnishing cast iron water pipes, branch pipes and special castings for the Borough of Brooklyn, and for furnishing, building and putting up two boilers and taking out four old boilers and appurtenances for the Borough of Manhattan. Forms of bid and specifications can be obtained at room 1715, 150 Nassau street.

It is estimated that since September 500 names have been added to the payroll of the works of the Wagner Palace Car Co. at Buffalo.

Although not officially confirmed, it is probable that an extension will be built to the plant of the Westinghouse Electric & Mfg. Co., to cost in the neighborhood of $300,000. We understand that bids have been received.

T. R. Wyles, 1564 Monadnock Block, Chicago, has recently been appointed the representative of the Detroit Graphite Mfg. Co., of Detroit, Mich., for Chicago and the Central West.

The two 10-wheel engines ordered by the Maine Central from the Schenectady Locomotive Works and referred to last week, will be equipped with No. 9 type D Hancock locomotive inspirators, made by the Hancock Inspirator Co. of Boston, Mass.

The offices of Francis Granger and of the Corning Brake Shoe Co. have been moved from 35 Nassau street to the Havemeyer Building, 26 Cortlandt street, New York.

It is stated that the Janesville Machine Co., of Janesville, Wis., intends to build a large warehouse in that city.

Iron and Steel.

The Ashman Steel Casting Co., Sharon, Pa., is improving its plant, most of the improvement being already contracted for. The company will put in a 12-ton open hearth furnace and two 15-ton electric traveling cranes, made by the Shaw Crane Co. The generator and electric work will be furnished by the Westinghouse Electric & Mfg. Co., and the engine by the Buckeye Engine Co. A 125-h. p. Wheeler tubular boiler will be installed. The buildings have not yet been contracted for.

The British bark Highlands has been chartered to load 2,000 tons of cast-iron pipe for London.

It is stated that the New York, Wyoming & Western has placed an order with the Lackawanna Iron & Steel Co. for 55 miles of 95-lb. rails.

Newspapers state that within the last few days orders have been placed for 500,000 tons of rails. Some of the orders mentioned are: The Chicago & Northwestern, 75,000 tons; Chicago, Milwaukee & St. Paul, 55,000 tons; Illinois Central, 50,000 tons. The reports say that the Federal Steel Co. has orders for 225,000 tons, of which 500 tons are for Honolulu, H. I., and the Carnegie Steel Co. for nearly 300,000 tons.

The British steamship Sandhill has sailed from Sparrows Point with 1,800 tons of rails and 50 tons of fittings for Bombay, India, and the schooner Major Pickands sailed for Barbadoes with 1,500 tons of rails and fittings.

New Stations and Shops.

The Chicago, Rock Island & Pacific intends to build a new pasenger station at Des Moines, Ia., work on which will probably begin in the spring.

Detail plans and specifications have not yet been prepared for the extension to the Windsor street station in Montreal of the Canadian Pacific.

The Union Railroad Company is building a square engine house at Munhall, Pa. It will be 55 ft. x 130 ft., with three tracks provided with engine pits and drop pits for removing drivers. The house will hold six engines and is being built for the use of engines doing the switching at the Homestead Steel Works. The structural work is being done by the Keystone Bridge Works and the brick work by the company's force at the Homestead Steel Works.

It is stated that the Lake Erie & Detroit River will build ferry slips and accessories at Sarnia, Ont., at a cost of $15,000. The building of a large elevator on the company's property is among the possibilities of the near future.

The Union Depot Co. at Fort Worth has been dissolved and it now seems that the Gulf, Colorado & Santa Fe and the Houston & Texas Central will build a station on the property of the Gulf, Colorado & Santa Fe, and that the Texas Pacific will also build a passenger station to accommodate any roads that may wish to use it.

An electric light plant is being put in at the new shops of the Peoria & Eastern Division of the Cleveland, Cincinnati, Chicago & St. Louis road at Urbana, Ill. This equipment will consist of two 34½ k.w. direct current 125-volt Westinghouse generators, belt driven from a center-crank class "A" 13 by 14 automatic engine built by the Buffalo Forge Co. All the buildings and grounds will be lighted by electricity, and 260 incandescent and 19 arc lamps will be put in for present use. There will also be a motor circuit for supplying power to machines.

C. J. Booth, President of the Canada Atlantic, is quoted as saying that plans are being prepared for a new Union station for Ottawa, Ont., to cost about $130,000.

The Canadian Pacific is building a new passenger station and office building at Vancouver, B. C. It will be 191 ft. by 70 ft. 5 in., French chateau style, with a central pavillion 80 ft. by 70 ft., eight stories high, with pitched roof, flanked by two wings four stories high with hiped roofs. Calgary stone will be used up to the first floor level, the superstructure being of specially made brick of a mottled buff color. The general waiting room will be 48 ft. by 78 ft., and 16 ft. high; ladies' waiting room, 32 ft. by 31 ft., with secondary waiting room and toilet attached; baggage room, 45 ft. by 32 ft. The building will also contain an express office, rooms for conductors, steamship mail service and heating plant; offices for steamship department, superintendent and various other departments. The entrance to the building is on Granville street, and is about 29 ft. above the track level.

The Canadian Pacific is building a combined station and hotel at Moose Jaw Junction, Assa., the meeting point of the Minneapolis, St. Paul & Sault Ste. Marie with the main line of the Canadian Pacific. The building will be 200 ft. by 34 ft., three stories and basement high, of Calgary stone to ground floor sill level, and brick with stone trimmings above that. The general waiting room will be 25 ft. by 30 ft.; ladies' waiting room, 23 ft. by 21 ft. The hotel office and dining room will be 30 ft. by 41 ft. and the lunch room 17 ft. by 30 ft. There will be about 30 bedrooms and a large drawing room and smoking room. The building will also contain offices for the Superintendent, clerks and Bridge Inspector, and a conductors' room, baggage and express rooms and lavatories.

We are officially informed that the report to the effect that the Missouri Pacific contemplates moving its Van Buren shops to Ft. Smith, is incorrect.

The plant of the Belle City Malleable Iron Co., Racine, Wis., has been destroyed by fire and it is stated that the loss on buildings, machinery and stock will amount to about $60,000.

It is stated that plans have been drawn and bids will soon be asked for the building of a joiners' and moulding shop, to be 60 ft. by 250 ft., in Superior, Wis., for the American Steel Barge Co.

It is reported that the contract for a new station to be built in Albany, N. Y., for the New York, Central & Hudson River, has been awarded to Norcross Bros., of Worcester, Mass.

Interlocking.

The National Switch and Signal Co. has just finished putting in interlocking switches and signals for the Chicago, Burlington & Quincy and the Iowa Central at the crossing of the two roads in Monmouth, Ill. The machine has thirteen levers.

Dynamometer Tests on the Cleveland, Cincinnati, Chicago & St. Louis.

The dynamometer car illustrated in our issue of Nov. 25, which was fitted up jointly by the Peoria & Eastern Division of the Cleveland, Cincinnati, Chicago & St. Louis, and the mechanical department of the University of Illinois, is now being used on that road in a series of tests to determine the hauling capacity of two classes of freight engines, a consolidation and 10-wheel locomotive. Information is being obtained by Prof. Breckenridge as to the draw bar pull and the weight of train which these engines can haul separately and together up the ruling grades, and the data obtained will be used as a basis for establishing a system of tonnage rating on that road. The recording apparatus gives remarkably consistent results, and it is expected that information in regard to train resistance will be obtained which will be of general interest.

Two Scherzer Rolling Lift Bridges for the Chicago River.

On Nov. 23 the Sanitary District trustees, Chicago, voted to build two Scherzer rolling lift bridges over the Chicago River to replace the present City swing bridge at Taylor street and the Wisconsin Central swing bridge between Twelfth and Taylor streets. To obtain the necessary amount of water for the Drainage Channel, it is necessary to either rebuild the swing bridges above mentioned and remove the center piers, or construct a by-pass on the west bank of the river. The engineering committee of the Sanitary District, after an investigation, has found that to replace the present swing bridges with bridges of the rolling lift type will cost about $314,000, or $95,000 less than to build the by-pass. The Scherzer Rolling Lift Bridge Co. has agreed to sell the designs for the two bridges to the Sanitary District and superintend the construction for $38,000, the Sanitary District having the right to receive bids and award the work to the lowest responsible bidder. Bids for these bridges will probably be asked for about Jan. 1.

Bids have been asked for by the Sanitary District on the Scherzer design of the Campbell avenue eight-track railroad bridge, and these bids will be opened Dec. 28. The contract for this bridge was awarded to the Scherzer Co. Aug. 6 last, but the lower courts decided that the contract was illegal in an injunction suit brought to set aside the agreement. Should this opinion be upheld by the higher court, where the case is now pending, a new contract will be made under this last bidding, so that the work may not be delayed longer than necessary.

Ventilation of the Gothard Tunnel.

For some time the management of the St. Gothard tunnel has been considering the question of the better ventilation of the tunnel. Forcing air under pressure through the tunnel to drive out the smoke will be tried. According to experience, the ventilation even now—at least for the travelers—is quite tolerable. When the windows are closed there is no trouble from the smoke, and the temperature is but few degrees higher in the middle of the tunnel, nor would a considerably long time in the tunnel in the slightest degree endanger the travelers. Quite otherwise, however, is it with the railroad watchmen, who even with shortened hours find it very oppressive. The better ventilation of the tunnel would, in the first instance, benefit the employees. The necessary pressure will be produced by water power, and the management contemplate at the same time introducing electric lighting.

THE SCRAP HEAP.

Notes.

The roundhouse and machine shop of the Zanesville & Ohio River road, at Zanesville, O., have been destroyed by fire. Loss, $10,000.

The steamer T. C. Walker was badly damaged by the explosion of its boiler near Stockton, Cal., on Nov. 27. Six persons were killed and 11 injured.

The Southern Pacific has turned out from its shops at Sacramento a passenger car sheathed with copper, like that in use on the New York, New Haven & Hartford, heretofore described in the Railroad Gazette. The Southern Pacific car is in service on a local passenger train between San Francisco and San Jose.

Chicago papers report that a "congress" of railroad employees of eight states is to be held in that city in January to protest against anti-railroad legislation, both state and national. The Secretary of the committee promoting the scheme is George Groobey, and one of the promoters is B. B. Ray, who was formerly Secretary of the Illinois State Railroad Commission, but who now figures as Major, U. S. A.

The Kentucky State Court of Appeals has affirmed the decision of the lower court imposing fines on a number of corporations for failure to make annual

reports to the State Auditor. The Louisville & Jeffersonville Ferry Company was fined $2,500, and the Central Railway & Bridge Company, of Covington, $1,000. The Minnesota State Railroad Commissioners have reported to the Attorney General, for his action, the matter of the refusal of the Great Northern Railway to answer certain questions propounded by the Commission. The road refuses to state what proportion of its gross earnings accrue in Minnesota.

Mr. W. R. Given, who for 12 years past has run excursions on the street railroads of Denver, Col., is preparing to start a similar enterprise at Los Angeles, Cal. The scheme, as managed at Denver, is to start an open car near the center of the city and make a trip of about two hours, in which all the principal sights of the city are pointed out and explained to the passengers. The distance traversed is about 25 miles, and the fare is 25 cents. An open car is used, which is about 40 ft. long, with a high floor and transverse seats. The conductor must be a person qualified to impart all requisite information to the passengers at each stop. It is said that on some of the trips in Denver nine carloads of passengers have been taken. The 40-ft. cars carry about 80 passengers each.

Vice-President T. H. Wickes, of Pullman's Palace Car Co., in testifying before the Congressional Committee which is investigating rates for transportation of mails, says that the life of a Pullman sleeping car is estimated at 20 years, but that after 12 years a car is either given over to unimportant service or is set aside for extraordinary occasions. About 400 such superannuated sleeping cars were taken from the Pullman yards for transportation of soldiers during the war. Mr. Wickes says that in nearly all of the later sleeping-car contracts made by the Pullman Company with railroads the rate of mileage is two cents. He says that for hauling empty cars, where there is no passenger traffic involved, the Pullman Company pays about 10 cents a mile on level roads and about 14 cents on others.

Technical Schools.

Massachusetts Institute of Technology.—At the last meeting of the Society of Arts, Mr. Frederic P. Stearns, Chief Engineer of the Metropolitan Water Board, delivered a lecture on the "Metropolitan Water Supply," illustrated by many interesting slides. Mr. Stearns gave an account of the work done by the Board, and of the many difficulties which had been overcome as the work progressed. The problem was (1) to collect good water and send it to the Sudbury system of reservoirs, and (2) to distribute it to the cities and towns within the 10-mile limit. The completion of the tunnel and aqueduct to Basin 5 in Southboro left the dam at Clinton, and the stripping and cleaning of the Wachusett Reservoir as simple, although immense operations to be performed. The distribution problem is now partially solved by the construction of two 48-in. pipe lines from Chestnut Hill to Spot Pond in Malden. The completion of the high service reservoir in the Fells will complete the work for the northern district. The natural topography at both Clinton and Malden is so fortunate that the Board is saved many millions of dollars by taking advantage of it. As a result, the water will cost less per million gallons than is supplied by the Croton Reservoir of New York, and even much less than the water from the economically built reservoir of the Sudbury and Cochichuate plants.

The Blackwell's Island Bridge.

Mayor Van Wyck, of New York, has sent to the Board of Public Improvement a letter urging action in regard to the proposed bridge over the East River to connect the Boroughs of Manhattan and Queens:

"I request that you will take all action necessary to be taken by your board before action by the Municipal Assembly, as to location, plans and construction of a bridge over the East River, between the Borough of Manhattan and the Borough of Queens.

"Without recommending any specific location, I suggest that the bridge be so designed as to cross the East River over Blackwell's Island.

"I request that this matter receive prompt attention, so that action by the Municipal Assembly can be taken at an early date."

The Board adopted a resolution directing the Commissioner of Bridges to prepare plans, surveys and soundings for the construction of the bridge.

A Circular Railroad for the Paris Exposition.

What is known as the Transportation Company of the Exposition has a concession for establishing and working during the exhibition a railroad to run around the borders of the space occupied. It is to be a closed circle with one track, and trains will move continually around, stopping only long enough to let off and take on passengers, and it is intended that the station stops shall be about 20 seconds. The total length will be 3,300 meters and the track will be laid to meter gage, with a third rail to carry the electric current. It is expected that in the hours of maximum service trains will be despatched every 90 seconds, and will make an inclusive speed (speed including stops) of about 10 miles an hour. Each train will have 200 seats, and by despatching these at intervals of 90 seconds, 8,000 seated passengers can be carried each hour. It is believed that during the 200 days of the Exposition a traffic of 12,000,000 passengers will be handled. Motor cars will be used to haul the trains, each one of them having four motors of 35 h. p. each.

Sixteenth Street Viaduct, Chicago.

By the opening of the new viaduct at Sixteenth street, noted in our issue of Nov. 25, which permits the Clark street cars to reach the business district over their former line, the question of trolley lines downtown has again been brought up. When the track elevation work at Sixteenth street was commenced last spring the City Railway Company secured permission for temporary trolley lines on State street and Wabash avenue from Twenty-second street and around a loop on Michigan avenue, Madison and Randolph streets, on condition that they should be removed when the Clark street viaduct was finished. When the viaduct was opened to traffic on Nov. 20 the company suggested to the city officials that the trolley be allowed to remain, and, on the request being refused by Mayor Harrison and the company held to its agreement, an ordinance was introduced into the City Council Nov. 21 giving the company permission to operate trolley cars in the business district. This ordinance has been referred to the Committee on Streets and Alleys South. Meantime the city has ordered the poles and wires taken down and the road has returned to the operation of all cars on State street and Wabash avenue by the cable. In reply to requests from residents of the South Side that the company be permitted to retain the trolley line, Mayor Harrison has replied that if the Chicago City Railway Company will agree to put in an underground trolley he will render all possible assistance in getting the right from the Council, but that he is opposed to the overhead trolley in the thickly-populated districts.

Report of Federal Commissioner of Railroads.

Gen. James Longstreet, United States Commissioner of Railroads, has made his annual report. He begins with a chapter on the railroad situation in general, and he recommends that the Government build and operate a double track railroad from Kansas City to San Diego. The Transcontinental lines, which it is the duty of the Commissioner to inspect, are in better condition than ever before. The report says that of the United States subsidy bonds under the acts of 1862 and 1864 to aid the Pacific railroads there have matured $50,618,952, of which $50,489,952 have been redeemed and paid out of the Treasury, leaving still due and unpaid $129,000. The remaining bonds of this issue fall due as follows: Union Pacific, Jan. 1, 1899, $3,157,000; Central Pacific, same, $9,197,000; Western Pacific, same, $1,650,560.

Chicago Notes.

The new northwest land tunnel is finished from the outer crib to Grand avenue and Green street, but on account of questions regarding the quality of the work on section 3, which is under construction by Weir & McKeechney, the Commissioner of Public Works has decided that no water shall be turned into the lake section at present.

The subway at Sixty-third and State streets, Chicago, under the tracks of the Lake Shore & Michigan Southern and the Pittsburgh, Fort Wayne & Chicago, has been completed and electric street cars will begin to run through it within a few days. The work on the elevated roadbed at this point is finished. Work on the elevation of the tracks of the St. Charles Air Line between the Illinois Central and Stewart avenue is being pushed. The tracks are already elevated and the subway bridges at street intersections are being put up. This work will be finished within about a month.

Press reports give a list of five large steamers which were wrecked on the lakes in the severe gale of Nov. 25, the loss on which will be heavy. In the three heavy storms since Oct. 20, the damage to lake shipping has been unusually severe.

Launching of the Battleship Wisconsin.

The new battleship Wisconsin was launched Nov. 26, at the Union Iron Works, San Francisco, in the presence of large crowds of spectators, including a party of Wisconsin state officials and invited guests. The Wisconsin is 368 ft. long, and 72 ft. 2½ in. beam, with a freeboard forward of 20 ft. and aft of 13 ft. 3 in. Her displacement is 11,520 tons, and her speed 16 knots. She has a waterline belt of nickel steel 16¼ in. thick and side armor of 5½ in. Her armament consists of four 13-in. breech loading rifles and seventeen 6-in. rapid fire guns.

Small Change in the Ticket Office.

The smallest coin in the Austrian currency until recently was a "kreutzer," 100 of which make a "gulden" (florin), which was meant to be equal to two German marks, or 48 cents, but in the depreciated Austrian currency has long been worth only about 41 cents. Recently a change was made, and a "heller," worth half as much as a kreutzer, was made the smallest coin, with 100 to the "crown." Thus a heller is worth about one-fifth of a cent. It sometimes occurs that a railroad ticket costs an odd number of hellers, and it has been complained that the ticket offices did not always keep a stock of these little coins, and then collected a heller more than the regular fare and made change in kreutzers. The Railroad Ministry has found the matter important enough to cause it to warn the railroads that they must keep a stock of hellers for change.

A Zone Tariff in Sweden.

A commission in Sweden has reported in favor of a new and radically changed passenger tariff, a zone system, but unlike other zone systems, with a reduction of nearly one-half from present rates for short distances, and the abolition of nearly all special rates, except for monthly commutation tickets.

The Deadly Trolley in Cairo.

It is reported that no less than 80 persons were killed on the Cairo (Egypt) electric railroad in the first four weeks after it was opened, and that since the victims number usually seven or eight weekly. Part of this is supposed to be due to the imperfect sight of many natives in consequence of the prevalent eye diseases, but more is probably due to the want of familiarity with such swift-moving vehicles.

An Anti-Scalping Conference.

A conference between commercial and transportation interests, under the direction of the United States Merchants' Association, was held at St. Louis on the evening of Nov. 29. Representatives of a number of commercial bodies, business associations and transportation companies in various sections of the country were present. Resolutions were adopted setting forth that the Government, having asserted the right to regulate and control interstate commerce, has assumed the responsibility of protecting common carriers against unjust attacks upon their revenues, declaring that ticket scalping is pernicious in its effects, unfair in its results, and is contrary to the American spirit of fair play. The resolutions are similar in tenor to those adopted recently at Chicago.

Mr. A. N. Compton, of Chicago, representing the Central Anti-Ticket Scalping Merchants' Association, is doing missionary work in various Western cities, and was at Indianapolis Nov. 25. He explained to officers of the Commercial Club why certain merchants have interested themselves in the anti-ticket-scalping bill now before Congress. He argued that merchants are interested in the suppression of ticket scalping because it is against public morals, public decency and common honesty. He showed that merchants, large or small, wholesale or retail, are directly interested in abolishing ticket brokerage because it is to their interest to have in their towns public gatherings, such as county fairs, Grand Army meetings, teachers' meetings, etc. The railroads do not grant low rates for such meetings at the present time because the brokers use such rates to deprive them of revenue which should accrue from regular travel.

223 Cents Per Ton Per Mile.

The Pacific & Arctic Railway & Navigation Co., which is the company that operates the White Pass & Yukon route, from Skaguay toward the Klondike gold region, has issued new tariffs for both freight and passengers. The railroad is at present only about 20 miles long, and, according to the time-table in the Official Guide, the trains do not run even so far as that, the schedules terminating at Heney, about 17 miles from Skaguay. But if the road is small, the tariff has nothing small about it. To Heney a ticket costs $3.40, and the first-class freight rate is $1.90.

Illinois Railroad Commissioners' Report.

The Illinois State Railroad & Warehouse Commissioners have transmitted their annual report to the Governor. The Commissioners recommend that street railroads, sleeping car companies, telegraph and telephone companies, express companies and the Union Stock Yards be placed under the control of the Commission. Many street railroad companies are now common carriers, and they are not required to make reports of their earnings and expenditures. The Commissioners also recommend the adoption by the state of a law similar to that in force in New York, requiring the charters for all new railroads to be approved by the State Railroad Commission.

Railroad Taxes in Illinois.

The State Board of Equalization of Illinois has made up its assessment of railroad taxes for the present year. The total valuation is $76,554,845.

Baker's Correspondence School.

A certificate of incorporation has been filed with the Secretary of State at Albany, N. Y., for the Railway Educational Association, of New York City to conduct a railway correspondence school; capital stock, $50,000. Directors, George H. Baker and Edwin Hawley, of New York City; Paul Morton, of Chicago, and George R. Brown, of Corning.

LOCOMOTIVE BUILDING.

The Manistee & Northeastern is in the market for one locomotive.

The Wabash is building at its Springfield shops a sample passenger engine.

We are informed that the Illinois Central will order from 15 to 20 engines before Jan. 1.

The Atlantic Coast Line has ordered two 10-wheelers from the Baldwin Locomotive Works.

The Louisiana & Arkansas has ordered one 10-wheeler from the Baldwin Locomotive Works.

We are informed, but not officially, that the Union Pacific is preparing to order about 40 locomotives.

The Baldwin Locomotive Works have received an order for five consolidation locomotives from the Erie.

It is reported that bids are all in for the Lake Shore & Michigan Southern engines, and that the 45 will be let within a week.

The Baltimore & Ohio has placed an order with the Pittsburgh Locomotive & Car Works for 50 consolidation engines, with 20 in. x 28 in. cylinders.

It is understood that the Intercolonial has placed an order with the Canadian Locomotive & Engine Co. for five more engines, making eight in all to be built for the road.

In our issue of Sept. 23 we noted that one locomotive would be bought by the Arkansas, Louisiana & Southern before the end of the year. This road has now ordered one eight-wheeler from the Baldwin Locomotive Works.

We are informed by Mr. William Garstang, Superintendent of Motive Power of the Cleveland, Cincinnati, Chicago & St. Louis, that his road does not contemplate buying any switching engines at this time, as reported by a contemporary last week.

The Chicago & Northwestern has just ordered six standard class A eight-wheel passenger engines from the Schenectady Locomotive Works. They will be duplicates of those previously ordered. The road will also shortly order more engines, probably about 30.

The Baldwin Locomotive Works have received an order from the Philadelphia & Reading for 10 consolidation freight locomotives. They will have 22 in. x 28 in. cylinders, will weigh about 80 tons, and will burn bituminous coal. The driving wheels will be 56 in. in diameter.

The eight 10-wheel locomotives ordered by the Oregon Short Line from the Cooke Locomotive & Machine Works, will have the following dimensions in addition to those given in this column last week: Heating surface, tubes, 2,055.4 sq. ft.; firebox, 188.6 sq. ft.; total, 2,244 sq. ft. Tubes, 265, 1¼ in. in diam.; grate area, 29.6 sq. ft.; wooden tender frame with plate iron body bolster; water capacity of tender 4,000 gals., and coal capacity 10 tons. The engines will be equipped with New York air and driver brake equipment; Allen-Richardson valves; Nathan 1899 sight feed lubricators; Consolidated safety valves; Kewanee brake beams; Nathan simplex injectors; A. French Spring Co.'s springs; Ashcroft gages; Leach sanding devices; Jerome metallic packing; Monarch block lagging; carbon steel in shell of boilers; Illinois and Otis steel in fireboxes; malleable iron eccentric straps; main wheel centers and driving boxes cast steel; driving wheel axles Taylor iron, and steel cabs.

CAR BUILDING.

It is rumored that the Iowa Central will order more cars.

The Burlington, Cedar Rapids & Northern will buy 400 freight cars.

It is rumored that the Wisconsin Central will order some stock and refrigerator cars.

The Chicago, Burlington & Quincy has issued specifications for 600 stock and 600 box cars.

The Chicago, New Orleans & Texas Pacific has asked bids for building 300 gondola, 100 flat and 100 furniture cars.

The Boston & Albany has ordered 300 cars from the Laconia Car Co. We noted in our issue of Nov. 18 that this road was asking bids for these cars.

In our issue of Nov. 25 we noted that the Chicago & West Michigan was in the market for 100 flat cars. The order has been placed with the Terre Haute Car & Mfg. Co.

The Gulf, Beaumont & Kansas City has placed the order for the 300 cars referred to in our issue of Nov. 25 with the St. Charles Car Co. One hundred and fifty will be flat and 150 box cars.

The Baltimore & Ohio has ordered 1,000 steel coal cars of 100,000 lbs. capacity, from the Schoen Pressed Steel Co. These will be used in connection with seaboard trade and are expected to be in service during the early part of next year.

The Illinois Car & Equipment Co. has received an order to build 400 standard Gk 80,000 lbs. capacity hopper gondola cars and 300 box cars of the same capacity for the Pennsylvania Lines West of Pittsburgh. These are for February delivery.

The New York Central & Hudson River Railroad has ordered 5,000 cars, as follows: Two thousand box, Pullman's Palace Car Co.; 1,000 box, Buffalo Car Co.; 1,600 box and 250 flat, Union Car Co., and 150 Roger ballast cars from the Wells & Franch Co.

In our issue of Nov. 18 we noted that the Southern Pacific was considering buying 1,000 50-ton box cars. We are now informed that the Ensign Mfg. Co. is preparing special designs for some 40 or 50-ton cars for this road, of which 1,000 will probably be ordered.

The Brooklyn (N. Y.) Heights has ordered 150 open cars for spring delivery, 75 from the St. Louis Car Co., 50 from the J. G. Brill Co., and 25 from the Briggs Carriage Co.

BRIDGE BUILDING.

ARCADIA, WIS.—According to reports, a steel bridge is contemplated over the Trempealeau River, and the village will be bonded for $3,000.

BINGHAMTON, N. Y.—A bridge over the Susquehanna River has been petitioned for by the Common Council.

BUFFALO, N. Y.—The viaduct over the Lake Shore & Michigan Southern and Erie tracks at Elk and Abbott road will be 1,400 feet long and will consist of two truss spans, 180 and 113.5 feet, respectively. The plans being deck girder, the masonry will be about the same length. Bids will be received some time during the winter. The subway on South Division street will be 740 feet over all, with superstructure of 233.25 feet. This work will be let by the N. Y. C. & H. R. E. B. Guthrie, Chief Engineer of the Grade Crossing Commission.

CARROLLTON, KY.—It has been reported that a company has been formed to build a bridge across the Kentucky River. (See Electric Railroad Construction column.)

CHATTANOOGA, TENN.—Engineer Betts is now surveying for a steel bridge over Chickamauga Creek.

CHICAGO, ILL.—A viaduct is to be built on Grand Ave., crossing the Chicago Great Western tracks. This is the first of the numerous viaducts that have been proposed to cross the railroad tracks.

The Commissioners of Public Works have decided to build two new bridges—one to take the place of the Taylor street swing bridge, and the other, the Northern Pacific swing bridge between Taylor and Twelfth streets. The estimated cost of replacing the old bridges is $314,000.

CLAYTON, MO.—It is stated that the St. Louis County Court will shortly advertise for bids for iron bridges. Wm. C. Wengler is Treasurer; Edgar Rapp, County Surveyor.

COHOES, N. Y.—It is stated that plans have been prepared for a plate girder bridge over the railroad tracks on Ontario street. (Sept. 23, p. 695.)

COLFAX, WASH.—The bid of O. H. Horton for building a bridge across the Palouse River at Palouse City was rejected. The bridge is to be 140 feet span, and the amount bid was $4,519.

HOLLISTER, CAL.—The plans and specifications submitted by R. T. Stone to the Supervisors for the bridge over San Benito River, south of Mulberry, have been accepted.

JACKSON, MISS.—The City Council has authorized the issue of $18,400 bridge bonds. Walter G. Kirkpatrick, City Engineer.

MILWAUKEE, WIS.—The extending of the Milwaukee Electric Railway to North Milwaukee will cause the changing of several bridges on the route. (See Electric Railroad Construction column.)

MINGO, PA.—The commissioners appointed to select a site for the bridge at Mingo, Montgomery county, recommended that a 60-ft. three-span iron bridge be built. Edwin M. Ritchie, County Surveyor, Norristown.

MT. VERNON, N. Y.—The city of Mt. Vernon has received communications from the State Railroad Commissioners and the New York, New Haven and Hartford Railroad Company, stating that the estimated cost of the bridge connecting North and South Third avenues, over the railroad's walled cut, is $8,832. (May 13, p. 340.)

A bill is being drafted to provide for a viaduct over the New York & Harlem Railroad tracks at West Mt. Vernon. The viaduct is to extend from the hill on Mt. Vernon avenue, over the railroad tracks and the Bronx River to Yonkers avenue. The Harlem (N. Y. C. & H. R.) is to pay one-third of the cost, the Union Railway Company, which proposed to run tracks across the viaduct, one-third, and the city of Mt. Vernon one-third of the cost.

MUSKEGON, MICH.—Plans for bridges over the Chicago & West Michigan tracks at Myrtle and Amity Sts., recently submitted by the railroad company, have been approved and adopted.

OAKLAND, CAL.—The contract for building the bridge over the estuary of San Antonio at Webster street has been awarded to Cotton Bros.. for $92,500. Frank C. Jordan, Clerk to Supervisors of Alameda county. (Oct. 14, p. 748.)

SCOTTSBORO, ALA.—A steel bridge over Crow Creek, near Stevenson, and several other bridges have been ordered by the County Commissioners.

TOLEDO, O.—The building of a bridge across Jefferson and Maumee streets is under consideration. W. F. Brown, Engineer.

TORONTO, CAN.—The proposed Canadian Pacific line to Sudbury will require a number of bridges. (See Railroad Construction column.)

UNION, ORE.—The Union Cornucopia & Eastern Transportation Company's new line will require five bridges. (See Railroad Construction column.)

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Boston & Albany.—Quarterly, 2 per cent., payable Dec. 31.

Chicago & Northwestern.—Quarterly, preferred stocks, 1¾ per cent.; semi-annual, common, 2½ per cent., payable Jan. 6.

Cleveland, Cincinnati, Chicago & St. Louis.—Quarterly, preferred, 1¼ per cent., payable Jan. 20.

Conductors' Benefit Association.

The Railway Passenger and Freight Conductors' Mutual Aid and Benefit Association held its twenty-fourth annual meeting at Chicago, Nov. 25. C. A. Loomis, of the Illinois Central, was chosen president and H. M. Mounts, of the Chicago & Alton, secretary.

The Engineers' Club of Philadelphia.

A business meeting of the Club will be held on Saturday, December 3, 1898, at 8 o'clock p. m. Amendments to the by-laws, offered at the meeting of November 5, will come up for discussion and amendment, and will be in order for final action on December 17. The paper will be, "Cement and Cement Testing Laboratories," by R. W. Lesley.

Civil Engineers' Society of St. Paul.

The members of the Minneapolis Engineers' Club and others to the number of 21, on invitation of the Civil Engineers' Society of St. Paul, met with that Society Nov. 23 to inspect the working of the car-raising device under the direction of Mr. David Curtin.

President Estabrook called the party to order at the Hotel Windsor, where Mr. Curtin explained the drawings and distributed them for examination. At 5:30 the members of the Society withdrew to an adjoining room long enough to elect Mr. C. A. Winslow Treasurer pro tem. All were then assembled in Parlor B to listen to remarks by Prof. Hoag, Mr. Crosby and others. Supper was announced at 6 p. m. This finished, the company returned to the parlor to smoke and pass an indefinite time socially. Mr. Crosby introduced the following resolution, which was passed:

"Whereas, We have this day examined the Bronsdon counterbalance on the Selby avenue hill, which has been operated during the past three months for a distance of 1,000 ft., 500 ft. on a 16 per cent. grade, thence about 200 ft. on a curve, and continuing to foot of lighter grade;

"Resolved, That in our opinion the installation of this device is thorough and durable in character. The iron and steel works seem well proportioned, with abundance of material in the various parts, and the workmanship is apparently good;

"Resolved, further That the Twin City Rapid Transit Company is to be commended for its effort to provide the public safe passage over this formidable ascent by means of a device which gives every indication of continued success."

President Cappellen, on behalf of the Minneapolis Club, closed the business of the evening by inviting the St. Paul Society to visit the beet sugar plant at St. Louis Park the coming month.

Engineers' Club of St. Louis.

The 479th meeting was called to order at 8:15 p. m., Nov. 16, 1898, President Bryan in the chair. Thirty-two members and thirteen visitors were present.

Prof. J. B. Johnson presented a paper, entitled "The Engineer as the Guardian of Public Health." The paper was brought out mainly by the recent development of the new theory of infectious diseases, whereby the engineering field has been greatly widened. The paper dealt with the various means by which the injurious bacteria found their way into the human system, and stated that it is very largely the scope of the engineer to supply means of prevention of such infection, such as the proper building and cleaning of streets, removal of sewerage and the supplying of pure drinking water. Some interesting statistics were given showing the decrease in the death rate due to typhoid fever, which was brought about by changes in source of supply and by filtration, and comparisons were made with German statistics, in which country the filtration of water supplies is almost universal. The universal adoption of sand filters in this country was urged as necessary to the preservation of public health; but, notwithstanding the great progress in Germany, but little advance has been made here. It is unquestionably true that municipalities can be held liable for the results of the furnishing of impure water.

As engineers understand causes of disease as well as the methods of prevention, it is their duty to form and lead public opinion, in providing safeguards to preserve the public health.

The writer traced some of the unsanitary arrangements of our residences and criticised slightly some defects of our sewer system. As we are provided with surface water from the Mississippi River, itself a great natural sewer, and as we are soon to have the sewage from a great city turned into this river, it will be an absolute necessity to provide a filtration plant for our water supply. The paper concluded with a brief statement of the duties of engineers in the preservation of public health and happiness.

The discussion participated in by Messrs. Colby, Moore, Johnson and Dr. Ravold was very interesting.

The President announced as the Committee on Nominations Messrs. Ockerson, Russell, Holman, Herman and Layman.

PERSONAL

—Mr. John C. Barclay has been appointed the electrician of the Western Union Telegraph Company in the Western Division, vice Mr. Charles H. Summers, deceased. Mr. Barclay has been in the service of the Western Union continuously since April, 1868.

—Mr. C. E. Fowler, Assoc. M. Am. Soc. C. E., has resigned his position as Chief Engineer of the Youngstown Bridge Co., and it is said that he will spend the winter in California. Mr. Fowler is well known to the profession, not only by his work, but by his writings on engineering subjects.

—Mr. Henry B. Seaman, M. Am. Soc. C. E., is retained to report to the Mayor and Common Council of the city of Syracuse on plans for the separation of street and railroad grades in that city. It is intended that the plans shall be ready to submit to the State Railroad Commission about April 15.

—Mr. Chalmers Scott, at one time an engineer on the Central Pacific, died in San Diego, Cal., Nov. 16. He was 53 years of age. Mr. Scott had charge of the survey of the extension of the Vaca Valley & Clear Lake Division of the Central Pacific. In August, 1883, he was appointed Chief Engineer of the Central American Pacific R. R. & Transportation Co.

—Col. Henry S. Haines, well known as the ex-President of the American Railway Association, of which Association he is now an honorary member, has been chosen Vice-President of the Atlantic & Danville, with office in New York City. The main line of this road is 205 miles long, from Norfolk, Va., to Danville. The President is Mr. B. Newgass, of London, and the General Manager is Charles O. Haines. Since his retirement from the Commissionership of the Southern Freight Association last year, Col. Haines has been for several months in Europe.

—Mr. William M. Wilson, President of the Fox Pressed Steel Equipment Co., died in New York Nov. 18, from the effects of an operation for appendicitis. Mr. Wilson was widely known among railroad men in the East and West. For many years he lived in Chicago, but for the past few years he has made New York his headquarters. He was born in Youngstown, O., and entered the steel business in Cleveland. After remaining there for a short time, he went to Chicago, representing the Otis Steel Co., of Cleveland, at that place. In this capacity Mr. Wilson demonstrated his executive ability and formed a wide acquaintance among railroad officials all over the country. In Chicago he also represented the Carbon Steel Co., of Pittsburgh, Pa. When the Fox Pressed Steel Equipment Co. of New York was being organized, in May, 1897, Mr. Wilson was chosen President, and successfully directed its affairs up to his death. He was also Vice-President of the American Steel Casting Co., and President of the American Coupler Co., of Chicago, besides being identified with numerous other concerns. He was taken to Warren, O., on a special train, for interment. He leaves a wife and two sons. Mr. Wilson was 46 years old.

ELECTIONS AND APPOINTMENTS.

Atchinson, Topeka & Santa Fe.—John Forster, Jr., has resigned as Master Mechanic at La Junta, Col. He has been succeeded by H. E. Ciacas, of Pueblo, Col.

C. A. Bristol, Chief Train Dispatcher at Raton, N. M., has been appointed Chief Dispatcher at Las Vegas, N. M. F. S. Mink has been appointed Roadmaster at Alberquerque, on the Santa Fe Pacific Division, succeeding E. C. Perkins.

Baltimore & Ohio.—E. H. Davis, Division Freight Agent at Clarksburg, W. Va., has been transferred to Cumberland, Md., vice W. R. McIntosh, resigned. F. Fowler, Traveling Freight Agent in West Virginia, will succeed E. H. Davis as Division Freight Agent, with headquarters at Clarksburg, W. Va.

Baltimore & Ohio Southwestern.—At the fifth annual meeting, held in Cincinnati, O., Nov. 28, the following new Directors were elected: Edward Bruce of New York, Oscar G. Murray of Baltimore and W. M. Greene of Cincinnati. The only change in the officers was the election of W. M. Greene as Vice-President, succeeding W. W. Peabody, whose resignation was recorded some time ago. (Oct. 28, p. 785.)

Brainerd & Northern Minnesota.—J. C. Howard, heretofore General Agent and Assistant Superintendent of the Chicago, Burlington & Quincy, at Minneapolis, Minn., has been appointed General Manager of the B. & N. M., with headquarters at Brainerd, Minn.

Bridgton & Saco River.—At the annual meeting of the stockholders, held at Bridgton, Me., Chas. E. Fessenden was elected a Director, succeeding Edward Kimball.

California Northwestern.—The Directors of this road are: George A. Pope, Geo. W. Prescott, F. A. Wickershaw, Geo. A. Newhall and A. W. Foster, who was also elected President. The officers of the operating department have already been given. (Oct. 7, p. 730.)

Central of New Jersey.—Norman E. Sprowl has been appointed Division Master Mechanic of the New Jersey Central Division, with office at Elizabethport, N. J.

Chicago & Alton.—J. E. Mitchell has been appointed Chief Train Dispatcher on the Chicago Division, succeeding F. Meyers, resigned. His headquarters are at Chicago.

Cincinnati, New Orleans & Texas Pacific (Q. & C.).—A. J. Chapman has been appointed Commercial Agent, with headquarters at Dallas, Tex.

Cumberland & Pennsylvania.—The title of M. L. Hamilton, General Superintendent, at Cumberland, Md., has been changed to that of General Manager, and the title of H. T. Brück, Master of Machinery, with headquarters at Mt. Savage, Md., has been changed to that of Superintendent of Motive Power.

Davenport, Rock Island & Western.—This company, which has been incorporated in Illinois as successor to the Davenport & Rock Island Bridge & Terminal Co., to build a line around Moline, Rock Island and Davenport, has elected officers and directors as follows: Directors—J. W. Gates, John Lambert, John

E. Drake, W. T. Palmer, H. B. Schuler, Frank P. Blair and E. P. Schuler. Officers—H. B. Schuler, President; Frank P. Blair, Vice-President, and E. P. Schuler, Secretary and Treasurer.

Escanaba & Lake Superior.—The officers of this company, referred to in the Construction column, are: Isaac Stephenson, President; J. A. Van Cleve, Marinette, Vice-President; John W. Wells, General Manager; H. A. J. Upham, Milwaukee, Secretary and Treasurer; W. E. Wells, Superintendent.

Flint & Pere Marquette.—J. F. Lints has been appointed Commercial Agent at Pittsburgh, Pa. This is a new office.

Grand Trunk.—P. F. Hodgson, Signal Engineer at Toronto, Ont., has resigned. J. C. Talmage has been appointed Traveling Agent, with headquarters at Los Angeles, Cal.

The position to which C. S. Cunningham was appointed is that of Trainmaster on the First, Second and Third Districts, with headquarters at Island Pond, Vt. This is the position which J. M. Herbert, now Superintendent of the Eastern Division at Montreal, recently vacated.

Kansas City, Memphis & Birmingham.—E. A. Ford has been appointed Trainmaster at Birmingham, Ala., succeeding Allen J. Smith, resigned. Mr. Ford has been heretofore Chief Dispatcher at Amory, Miss.

Lehigh Valley.—Walter G. Berg has been appointed Engineer of Maintenance of Way, with office at South Bethlehem, Pa., succeeding Richard Caffrey, assigned to other duties. Mr. Berg was heretofore Assistant Engineer at Jersey City, N. J.

Los Angeles Terminal.—J. O. Dodge, heretofore Chief Train Dispatcher, has been appointed Trainmaster, succeeding James Downey, with headquarters at Los Angeles, Cal.

Lowell & Hastings.—C. A. Gordon has been appointed Chief Engineer, with headquarters at Grand Rapids, Mich.

Manhattan.—Alfred Skitt has been elected a Director and Vice-President. As Director he takes the place of A. L. Hopkins, resigned, and as Vice-President the place of Robert M. Gallaway. Mr. Skitt, it is said, will relieve President George Gould of the details of the management.

Michocan & Pacific.—W. J. Cox has been appointed Trainmaster, with headquarters in Mexico, Mex.

Missouri, Kansas & Texas.—Edward H. Coombs has been appointed Commercial Agent at Dallas, Tex.

Nashville, Chattanooga & St. Louis.—C. D. Boyd, New England Freight Agent of the Southern in Boston, has been appointed Assistant General Freight Agent of the N., C. & St. L., with headquarters at Nashville, Tenn.

New York Central & Hudson River.—W. B. Pollock, heretofore Freight Auditor, has been appointed Superintendent of the Lighterage Bureau and Foreign Freight Department, with headquarters in New York City. He suceeds Alfred Skitt, resigned. Frank E. Briggs has been appointed Acting Auditor, succeeding Mr. Pollock, with headquarters at New York also.

Omaha, Kansas City & Eastern.—C. A. De Haven has been appointed Division Master Mechanic, with headquarters at Stanberry, Mo.

Oregon Short Line.—E. H. Harriman has been elected Chairman of the Executive Committee.

Pennsylvania.—S. J. Dillon, heretofore Foreman of the erecting shops, has been appointed General Foreman of Passenger Car Repairs, with headquarters at Waldo Ave., Jersey City.

Peoria, Decatur & Evansville.—S. J. Cassetty, Assistant General Freight and Passenger Agent, at Peoria, Ill., has resigned.

Philadelphia & Reading.—J. Carlton Duke, General Agent of the Gettysburg & Harrisburg Division, with headquarters at Carlisle, Pa., has resigned. W. N. James, Traveling Freight Agent of the P. & R. at Philadelphia, has been appointed to succeed him, with headquarters at Carlisle, Pa.

Pittsburgh, Bessemer & Lake Erie.—H. T. Porter, heretofore Engineer Maintenance of Way at Pittsburgh, Pa., has been appointed Chief Engineer and his former position abolished.

Plant System.—At the annual meeting of the stockholders, held in Savannah, Ga., Nov. 29, F. O. Brown of Boston was elected a new Director.

Richmond & Petersburg (A. C. L.).—At the annual meeting of the stockholders, held in Richmond, Va., Nov. 21, Alexander Hamilton was elected President, succeeding the late Frederick R. Scott.

St. Louis & San Francisco.—Bryan Snyder, Assistant General Freight Agent, has been appointed General Passenger Agent, succeeding B. L. Winchell, resigned. He has been succeeded as Assistant General Freight Agent by Charles Hall, heretofore General Agent in the Freight Department, with headquarters at St. Louis, Mo. James Donahue, heretofore General Agent in the Freight Department at Kansas City, Mo., has been appointed Assistant General Freight Agent, with headquarters at the same point.

St. Louis, Iron Mountain & Southern.—M. Roberts, heretofore Division Master Mechanic at Argenta, Ark., has been appointed Master Mechanic for the entire system, with headquarters at De Soto, Mo. He succeeds W. H. Harris, resigned on account of ill health. (Nov. 25, p. 852.)

Santa Fe, Prescott & Phoenix.—At the annual meeting of the stockholders, held recently, E. B. Gage of Prescott, Ariz., was elected a Director, succeeding W. L. Bashford.

Seaboard Air Line.—T. J. Anderson, General Passenger Agent, has resigned. It is expected that his successor will not be appointed until Jan. 1.

Southern.—W. C. Harrison, heretofore Soliciting Agent at Richmond, Va., has been appointed New England Freight Agent, with headquarters at Boston, Mass. He succeeds C. D. Boyd, resigned.

Southern California (Atchison, Topeka & Santa Fe.)—W. G. Nevins, General Manager at Los Angeles, Cal., will have his authority extended over the San Francisco & San Joaquin Valley line, which was recently purchased by the Atchison, Topeka & Santa Fe. It is reported his headquarters will remain at Los Angeles.

Toledo, St. Louis & Kansas City.—Samuel Hunt has been appointed Receiver, suceeding R. B. F. Pierce, resigned on account of ill health. Mr. Hunt is President and General Manager of the Cincinnati, Portsmouth & Virginia, General Manager of the Brockville, Westport & Sault Ste. Marie, Vice-President of the Dayton, Lebanon & Cincinnati, and General Manager of the Northern Alabama railroads. His headquarters are at Cincinnati, O.

Union Pacific.—W. H. Davenport has been appointed General Agent of the Freight Department, with headquarters at 101 Front St., San Francisco, Cal., succeeding T. M. Schumacher, resigned. E. T. Duffee, Chief Train Dispatcher at Laramie, Wyo., has resigned. He is succeeded by A. H. Stewart.

Velasco Terminal.—B. Lindemuth has been appointed General Passenger and Ticket Agent, succeeding W. W. Anderson, with headquarters at Velasco, Tex. Mr. Anderson has been appointed Emigration Agent, with headquarters at same point.

White Pass & Yukon.—C. C. Figgins has been appointed General Agent, with headquarters at Seattle, Wash.

Wilmington & Weldon (A. C. L.).—At the annual meeting of the stockholders, held in Wilmington, N. C., Nov. 23, the following were the new Directors elected: Julius Davis, J. W. Norwood and Donald McCrae, all of Wilmington, Del.

RAILROAD CONSTRUCTION,
New Incorporations, Surveys, Etc.

ATLANTIC & LAKE SUPERIOR.—Good progress is being made on the extension from New Carlisle, Que., into Paspediac and work will soon be started on the bridge over the Bonaventure River. (Nov. 4, p. 804.)

BANGOR & AROOSTOOK.—See Railroad News column.

BLACK DIAMOND.—Sir James Tancred, the English engineer sent to this country by an English syndicate, after spending some weeks in going over the route of this proposed system, is reported to have stated to the promoters his intention to recommend it for investment. The main line is projected to extend from Fargo, N. D., south via Vincennes and Vevay, Ind.; Ghent, Ky.; Knoxville, Tenn., and Anderson, S. C., to Port Royal, 1,906 miles, with branches in Indiana, Ohio and Kentucky, making the aggregate 2,325 miles. Albert E. Boone, of Dover, Ky., is chief promoter. (Sept. 30, p. 714.)

BRANDON & SOUTHWESTERN.—The charter of this company required that work should be begun in November this year, but so far as can be learned there are as yet no activities and it is probable that the ground will not be broken before another spring. The line is to run from Brandon, Man., southwest to Waskava, 90 miles. (Sept. 9, p. 676.)

CANADIAN PACIFIC.—The details of the survey of the line from Toronto, Ont., to Sudbury, show that the route is from Kleinburg, 21 miles from Toronto, on the main line, to run north 226 miles, near Lloydstown, Allandale, Bondhead, Cookstown and Barrie, to cross the Severn River nine miles up from Port Severn. The maximum grade ascending northerly is 1%. The maximum curvature is 6°, but there are only a few exceptional places where this curvature is required. The bridging is not heavy. The largest bridge will be just north of Kleinburg, where the Humber Valley, 1,200 ft. wide and 110 ft. deep, must be crossed. Among the streams of importance to be crossed are the Severn, with a span of 150 ft.; the Musquath, one span of 100 ft. and one of 150 ft. There will be other bridges of from 60 ft. to 100 ft. (Oct. 14, p. 750.)

Sir William Van Horne states, in reference to the building of the line into New Westminster, B. C., that nothing will be done until surveys have been made. The object is to give New Westminster better facilities. The present main line runs from Westminster Junction 6.8 miles to Vancouver. From Westminster Junction the Westminster Branch runs to New Westminster, 8.2 miles. It is the intention to extend this branch to Vancouver direct, so that the main line will run from Vancouver Junction via New Westminster to Vancouver. This will lengthen the distance between the two points, but considerable saving will be effected in the operating of the Westminster Branch. Trains from Vancouver to New Westminster must now travel 25 miles additional, in consequence of going around by Westminster Junction, where the distance by the electric trolley line is only 12 miles. (Nov. 11, p. 820.)

The ratepayers of Vancouver have voted affirmatively on the by-law to except the company's yard and works from taxation for 20 years, and it is expected that work will be begun on the proposed improvements in that city early next spring. This will include extending the water front between Carrall street and the west end of the company's present wharves.

President Van Horne recently stated that nothing would be done toward building the line to connect Penticton, B. C., direct with the Pacific Coast until the line between Boundary Creek and Penticton is completed.

CARIBOO-OMINECA CHARTER COMPANY.—In 1890 the British Columbia Legislature incorporated the Ashcroft & Cariboo Ry. Co. in the interest, it is understood, of the C. P. R., to build a railroad of not less than 3 ft. gage from a point on the C. P. R. main line near Ashcroft, B. C., north to or near Barkerville in the Cariboo District. The act gave the usual general powers with a land grant of 20,000 acres per mile for a standard, or 10,000 acres per mile for a narrow gage line. In 1894 an amending act changed the name to the Cariboo Ry. Co., and provided that the line might start from the C. P. R. at any point between Ashcroft and Kamloops. A further act in 1897 provided that the starting point on the C. P. R. and the whole route should be approximately defined by the company, subject to the Provincial Government's approval by May 8, 1899, upon which date grading should be begun and the line completed by May 8, 1903. This charter has recently been sold to the Cariboo-Omineca Charter Company, which was incorporated at the last session of the British Columbia Legislature. This company is composed of English shareholders, the Secretary being C. J. Gardiner, 27 Clements Lane, Lombard street, London. The representative in Canada is R. J. Tatlow, Vancouver, B. C. The prospects of early building are reported to be good. The line will afford railroad communication for the Cariboo Mining District, which produced enormous quantities of gold in the sixties. The distance from the C. P. R. at Ashcroft to Barkerville is 280 miles, and there is an excellent wagon road built by the British Columbia Government between the two points. (Nov. 4, p. 804.)

There is also another charter in existence for a line over the same route, that of the Barkerville, Ashcroft & Kamloops, granted by the British Columbia Legislature in 1897. The promoters are A. J. Garesche and H. P. Bullen of Victoria, B. C., and G. H. Ward of Spokane, Wash.

CASSIER CENTRAL.—D. Self, Manager of this road, is reported by our Canada correspondent to have stated at Wrangel, Alaska, that it is the intention of the company to build a line from Glenora, B. C., to Dease Lake in the spring, and that surveys are now in progress for the continuation from Dease to Teslin. The country between Dease Lake and Teslin is found to be remarkably level and free from underbrush, and the country is rich in minerals, both placer and quartz.

CHICAGO & NORTHWESTERN.—Mitchell Vincent of Onaway, Ia., is reported to have received the contract for building a portion of the line from Wall Lake, Ia., to Mondamin, and work is to be begun at once under the charter of the Boyer Valley. (Nov. 25, p. 852.)

CHICAGO, BURLINGTON & QUINCY.—Surveys are reported completed for the extension of the Hill City branch, which now runs about four miles beyond Hill City, southeast six miles to Keystone. It is stated that work is to be begun in the spring.

CINCINNATI, HAMILTON & DAYTON.—Surveys are reported completed for an extension from Piqua, O., north about 25 miles to New Bremen.

COLORADO & NORTHWESTERN.—Day & Ryan are reported to have received a contract for a branch to the B. & M. mine at Ward, Col. It is stated that work is being pushed on the Bloomerville branch, which is soon to be completed. (July 22, p. 538.)

COLUMBIA & KLICKITAT.—This company was incorporated in Oregon Nov. 16, with a capital stock of $300,000, to build a line from a point on the Columbia River in Klickitat County, at or near Lyle, northeast about 20 miles to Goldendale and to consolidate with, lease or operate any roads in Oregon or Washington. E. E. Lytle, D. C. O'Reilly and A. E. Hammond are among the incorporators. The central office is at Wasco, Ore. Mr. O'Reilly is General Manager of the Columbia Southern, now building.

COLUMBIA SOUTHERN. — A claim brought against this company by S. W. Aldrich, contractor, has caused a temporary tie-up of building operations. All of the grading is completed and much of the track laid from Wasco, Ore., south 17 miles to Moro. D. C. O'Reilly, Wasco, Ore., is General Manager.

COLUMBUS, LIMA & MILWAUKEE.—It is stated that over 1,000 tons of 75-lb. rail are on the cars at Dorninton, which will be used for the line between Defiance, O., and Lima. A "Y" has been placed west of Ottawa to connect the new line with the Findlay, Fort Wayne & Western. J. G. Cowles of Cleveland, O., is President, and C. T. Hobart of Defiance, Chief Engineer. (Nov. 11, p. 820.)

DAYTON & FAUNSDALE.—Representatives of this company have called for a meeting of the people of Greensboro, Ala., to solicit subscriptions. This company was incorporated in Alabama last December, and proposes to build a line from Dayton northeast about 10 miles to Faunsdale, on the Southern, with branches into the Warrior and Brockton coal fields. G. L. Sibbons, of Dayton, Ala., is President. (Dec. 17, 1897, p. 898.)

DENVER & RIO GRANDE.—The extension from Leadville, Col., to coal mines, 6.1 miles, is completed and in operation. (Nov. 25, p. 852.)

DULUTH, MISSISSIPPI RIVER & NORTHERN.—The General Manager writes that nothing definite is determined as yet with regard to the proposed extensions north to the Canadian border and southeast into Duluth.

ESCANABA & LAKE SUPERIOR.—This company was incorporated in Michigan, Nov. 17, to build the road heretofore referred to as the Escanaba River (Nov. 25, p. 852), from Escanaba, Mich., northwest about 60 miles, to Republic, upon the Chicago & Northwestern. It is stated that 30 miles of the road is to be completed this winter. The officers are given under Elections and Appointments.

FARMINGTON & IRONDALE.—This company was incorporated in Missouri, Nov. 26, with a capital stock of $200,000, to build a line from Irondale, Washington County, on the St. Louis, Iron Mountain & Southern, east 20 miles to Farmington. The incorporators are: H. J. Cantwell, W. M. Carter, J. W. Evans, A. M. Sager and E. H. Wagner. The main office is at Farmington.

FARMVILLE & POWHATAN. — Commissioners have been appointed by Judge Clopton of the Chesterfield (Va.) County Court to condemn land for the proposed extension from Chester north 11 miles to Manchester, on the James River, opposite Richmond. This extension will practically parallel the A. C. L.

FITCHBURG.—Grading is reported in progress for an extension from Schuylerville, N. Y., northeast, crossing the Hudson River to Thompson's Mills.

GALESBURG & GREAT EASTERN.—An extension of two miles is reported completed to Victoria, Ill., and grading is in progress from that point east 19 miles to Wyoming. From Wyoming it is proposed to build on to Lacon, 21 miles. Henry C. Harms of Etherly is President and A. R. Richey of Galesburg, Ill., Chief Engineer. (Nov. 11, p. 820.)

GALVESTON, BRAZOS & SOUTHWESTERN.—L. P. Featherstone, an official of this company, has recently been in Galveston, Tex., seeking a franchise for right of way into that city. The line is projected from Galveston west about 150 miles to Victoria. L. E. Beadle of Galveston, Tex., is Chief Engineer. (Nov. 18, p. 838.)

GREAT NORTHERN.—Foley Bros. of St. Paul,

Minn., are reported to have begun grading for the Coon Creek cut-off from Coon Creek, Minn., north 56 miles, via Cambridge, to Brook Park. (Nov. 25, p. 852.)

Official announcement is made that the line of the Park Rapids & Leech Lake extension from Akeley, Minn., 18.6 miles, from Park Rapids, is open to Walker, 9.5 miles.

GULF & SHIP ISLAND.—Surveys are to begin soon, according to report, for the proposed extension from Hattiesburg, Miss., north toward Natchez.

GULF, BEAUMONT & GREAT NORTHERN.—An order has been placed with the Industrial Lumber Co. for 2,000,000 ft. of ties and timber, which is being cut at the mills at Silsbee, Tex. This lumber will be used for the extension north from Kirbyville, upon which, it is stated, track laying has begun. Preparations are being made to let a contract for 50 miles more of road. John H. Kirby of Houston, Tex., is President. (Nov. 18, p. 838.)

ILLINOIS CENTRAL.—James H. McShane & Co. of Omaha, Neb., has the contract for the Fort Dodge & Omaha extension from Fort Dodge, Ia., southwest 110 miles to Omaha, Neb. Locating Engineer Grafton of the I. C. has opened local offices in the McCague Bldg., Omaha. The engineer's headquarters are maintained at Denison, and surveying parties are working north and south from that point. (Nov. 25, p. 852.) Newspaper reports state that the company will build a line from Kentwood, La., northwest 50 miles to Columbia, Miss., using an old logging road for a portion of the distance.

Improvements are in progress in the yards at New Orleans, La., Memphis, Tenn., and Fulton, Ky. At New Orleans a portion of a terminal yard is being built; at Memphis, the in and out freight yards are being enlarged and arranged to secure expedition in handling cars, and a division storage yard is being built at Fulton.

The franchise permitting this company to operate on Louisiana avenue along the river front at New Orleans, La., will expire December, 1899. In order to secure a renewal of this privilege, President Fish stated to the City Council and the Orleans Levee Board, that the company would build and maintain, at its own cost, a levee 40 ft. wide and 4 ft. above the flood line of 1897, from Peniston street to the upper city limits, which is about two-fifths of the city's river front. In return he asks the right to build and operate two main tracks on the levee as a part of its system, leaving ample space for laying of a third track to be disposed of by the city, for the use of a belt railroad, or of such other railroad corporations requiring facilities along the river front, as may be willing to contribute a pro rata share of the cost of building and repairing the levee. The two tracks will be used by the Yazoo & Mississippi Valley and the T. C.

INVERNESS & RICHMOND.—This company was incorporated by the Nova Scotia Legislature in 1887 to build a line from the Straits of Canso at or near Port Hawkesbury by way of Port Hood and Margaree to Cheticamp, with a branch from or near Marbou to connect with the Intercolonial at or near Orangedale. For the first 53 miles to Port Cavé Mines, the Dominion Parliament has voted a cash bonus of $3,200 a mile. The Nova Scotia Legislature has voted a similar amount and the county of Inverness $1,000 a mile. This section has been surveyed, and some time ago about 15 miles of the line, from Port Hawkesbury north, was partially graded and the company has had some men at work since July last to comply with the act. Peter Ryan, of Toronto, Ont., is among those interested. (Nov. 18, p. 838.)

KANSAS CITY, PITTSBURGH & GULF.—The Supreme Court of Texas has handed down a decision in favor of the Port Arthur Channel & Dock Co., which is building terminals at Port Arthur, Tex., for the K. C., P. & G. The work includes a deep water canal 6½ miles long, and work will now be carried forward.

LAKE ERIE & DETROIT RIVER.—Bonuses have been voted for an extension of this line from Ridgetown, Ont., northwest about 65 miles to St. Thomas, as follows: St. Thomas, $20,000; Dutton, $2,500; Albry, $7,000, and Orford, $2,000. (Aug. 19, p. 603.)

LEHIGH VALLEY.—Surveyors are reported in the vicinity of Lockport, N. Y., seeking an entrance for an extension into that city.

LOWELL & HASTINGS.—C. A. Gordon, of Grand Rapids, Mich., the recently appointed Chief Engineer of this road, is locating an extension from Lowell, Mich., north about 20 miles to Greenville. The old line from Lowell to Freeport is to be improved, and the company contemplates extending the line from Freeport, south 12 miles, to Hastings. (Official.)

MINNESOTA SOUTHERN.—This company was incorporated in Iowa Nov. 19, to build a railroad from Kansas City, Mo., north 520 miles, through Bedford, Corning, Guthrie Center and Sac City, Ia.; Jackson, Windom, Redwood Falls and Wilmer, Minn., to Sauk Center, Minn. The intention of this line is said to be to connect the Great Northern with the Kansas City, Pittsburgh & Gulf. The officers and directors are: President, John S. Thompson, New York; Vice-President, William T. Smith, S. A. Robertson, Des Moines; Treasurer, Robert M. Snyder, New York; John K. Brown, Jackson, Minn.; W. H. Redman, Des Moines; Charles W. Thompson, Tacoma, Wash.

MUSCATINE NORTH & SOUTH.—The Tennis Construction Co. of Philadelphia, which had the general contract for grading this line, has disposed of its interests to Balch, Pepard & Johnson of Minneapolis, sub-contractors, and to Henry Lewis & Co., Philadelphia, who supply the rails. It is stated that the line is to be completed the entire distance from Muscatine, Ia., south 30 miles to Elrick on the Iowa Central, early in January. W. R. Stewart, Jr., 58 Board of Trade Building, Chicago, is President. (Nov. 18, p. 838.)

NEW YORK, WYOMING & WESTERN.—An order for 55 miles of 95-lb. rails is reported to have been placed with the Lackawanna Iron & Steel Co., Scranton, Pa., for use on that section of the road from Wimmers, 12 miles east of Scranton, to run east to the Delaware River. It is stated that the Erie and Wyoming Valley tracks are to be used into Scranton. All the routes for the new road are said to be surveyed and location will be made within a few days. It is stated that about 25 coal operators will avail themselves of the line, and transportation contracts have been made with a considerable number of them. The route into New York City is as yet unannounced. E. B. Sturges of Scranton, Pa., is President. (July 22, p. 538.)

NORTHERN PACIFIC.—At a recent meeting of the City Council of Minneapolis, Minn., an ordinance was read providing for the abolition of grade crossings, the railroad companies to bear the expense of raising the tracks and to be held responsible for damage to abutting property. The city will make changes only in the street grades. This ordinance affects chiefly the Northern Pacific. The terms of the ordinance require that road to file its acceptance within 30 days of the publication, and to submit maps, plans and profiles to the City Engineer within 60 days from its publication.

The Minister of Public Works has begun an inspection of the new Belmont extension from near Belmont, Man., on the Morris & Brandon Branch, west 51 miles to Hartney, on the C. P. R. (Oct. 28, p. 786.)

NORTHWEST.—Isaac E. Blake of 11 Broadway, New York, President of the company, states that grading is to begin early in December for this line from Huntington, Ore., north down the valley of the Snake River to Oxbow and Ballard's Landing, in the Seven Devils mining district. (Sept. 9, p. 656.)

PECOS VALLEY & NORTHEASTERN.—Announcement is made that the line is open from Amarillo, Tex., south 116 miles to Portales, N. M., with a daily train in each direction. (Nov. 11, p. 820.)

PHILADELPHIA, LOUISVILE & GREAT NORTHERN.—Surveys have been made, according to report, for this line, projected to run from Philadelphia, Miss., north 38 miles via Louisville, to Fentress on the Illinois Central.

QUINCY & EASTERN.—A railroad is projected under this name from Camp Point, Ill., on the Chicago, Burlington & Quincy, east to the coal fields in Brown and Schuyler counties. It is stated that it is to form a nucleus for a line to Beardstown and Havana. T. A. Clark, a projector, asks the Chamber of Commerce of Quincy for the loan of $2,000 to carry on preliminary work.

RESTIGOUCHE & WESTERN.—Up to Oct. 8 the first 20 miles of this line, from near Campbellton, N. B., west about 106 miles to St. John River, had been located and 15 miles revised. The contractors, Malcolm & Ross, of St. Leonard, N. B., have 500 men at work. The first 10 miles is graded, and grading started on the next section. A steamer was then at Campbellton Dock with the first cargo of rail, and track laying and ballasting were to be carried forward at once. On Nov. 18 the Chief Engineer stated that rails were laid on the first section of 10 miles, and that surveyors would be in the field locating all winter. (Nov. 4, p. 804.)

ROCKVILLE, WESTPORT & SAULT STE. MARIE.—E. R. Dick, President of the Philadelphia Investment Company, that owns the line, recently made an inspection, and he states that the road has been put in good condition and needs only the renewal of certain bridges now in progress.

SACRAMENTO VALLEY.—Grading is reported begun on this line from McConnico Junction, near Kingman, Ariz., northwest 53 miles, via Chloride, to White Hills. Dr. Theodore B. Comstock, Vice-President and Chief Engineer, is at Kingman directing the work. C. E. Loss & Co., 621 Pullman Bldg., Chicago, have the contract. (Nov. 18, p. 839.)

SAN FRANCISCO & SAN JOAQUIN VALLEY.—The entire line is located between Stockton, Cal., and San Francisco. It will pass west from Stockton, crossing the overflowed lands of the San Joaquin; thence northwest to Antioch; thence parallel with the Southern Pacific to Bay Point Station, crossing the S. P. at this point. It will pass about two miles south of Martinez, crossing the Coast Range by a tunnel 5,700 ft. long, following Rodeo Creek to the vicinity of San Pablo Bay; thence parallel to the S. P., and to the east of that line as far as San Pablo station. It will thence pass by almost direct route to what is known as Point Richmond on San Francisco Bay, from which terminus a ferry line will be established to San Francisco. The right of way is practically all obtained, and grading is in progress on 35 miles. (Sept. 23, p. 697.) The long tunnel is over one-third completed and all the work is progressing satisfactorily. (Official.)

SANTA FE, PRESCOTT & PHOENIX.—An official writes that no definite steps have been taken regarding the extension of the main line to Tempe and Mesa, Ariz. The question is under consideration, and will undoubtedly have proper attention as soon as the management decides that it is time for action. (Nov. 11, p. 821.)

SOUTH CAROLINA & GEORGIA.—In the annual report it is stated that the old abandoned roadbed, 15 miles in length, running from Wateree Station, S. C., on the Camden branch, to the city of Sumter, has been bought, and that the road will be extended through the coming winter to centrally located terminal lands purchased in the heart of that city. Notice has already been given of this road under the old title of Sumter & Wateree. (Nov. 25, p. 853.)

During the year ended June 30 710 tons of 70-lb. rail was laid. There was 6.12 miles of new side track and 123,639 cross ties laid. The filling of the Wateree trestle was completed in November, ult.

SOUTHERN PACIFIC.—The tunnel on the Central Pacific, near Truckee, Cal., which was recently damaged by fire, has been repaired and is now open to traffic.

This company is reported making surveys in Utah, south through the sulphur beds and Clear Creek Canyon toward Beaver City.

TENNESSEE CENTRAL.—Mason & Hogue of Louisville, Ky., have received the contract, according to report, for an extension of this road toward Monterey, Tenn. Jere Baxter of Nashville, Tenn., is President. (Aug. 5, p. 571.)

TOLEDO & MONROE.—C. E. Loss & Co. of Chicago, are reported to have a contract for building this line from Toledo, O., north 22 miles to Monroe, Mich. The company was incorporated in Michigan last March. Henry S. Evans of Monroe, Mich., and John N. Bick of Toledo, are among the incorporators.

UNION, CORNUCOPIA & EASTERN TRANSPORTATION COMPANY.—Engineers are making surveys for its line from Union, Ore., southeast through Pine Valley to Ballard's Landing on Snake River, and thence to Bear, Idaho. Contracts are let for the first 10 miles to Lee Tung Yin, 147 Second street, Portland, Ore. There are 150 men at work. The grade is light and the line will require five bridges. Bids will be asked in the spring for rails and rolling stock. (Nov. 11, p. 821.) Geo. E. Howe, of Union, Ore., is Chief Engineer.

This company has just been incorporated in Oregon, with a capital stock of $3,500,000. The incorporators are: S. C. Spencer, C. N. Scott, Lee Tung Yin, Joseph Johnson and B. B. Tuttle.

UNION SPRINGS & NORTHERN.—This company is incorporated in Alabama, with a capital stock of $10,000, to build a railroad from Union Springs, north about seven miles to Fort Davis.

UTAH & PACIFIC.—Rails are reported laid for 12 miles on this line from Milford, Utah, southwest 76 miles to the Nevada state line. Work is proceeding slowly at present on account of shortage of ties. (Nov. 4, p. 804.)

VISALIA & TULARE.—The City Council of Tulare, Cal., has notified the company to raise its tracks along Tulare street to correspond with the new grade of the street.

WASHINGTON RUN.—Bennett & Talbot of Greensburg, Pa., are reported to have received a contract for building this line from Layton Station, Pa., to Stickel Hollow, 5½ miles. It is to be used as a coal road. W. H. Brown of Pittsburgh is President, and E. J. Taylor, McKeesport, Pa., Chief Engineer.

WAYCROSS AIR LINE.—Grading is reported in progress for an extension to Grady, Ga., three miles above Douglas.

YELLOWSTONE PARK.—Grading is reported completed for the entire Trail Creek Division, formerly known as the Gallatin, and it is stated that track laying is to be begun at once. Cook & Woldson have the contract. W. W. D. Turner of Spokane, Wash., is President. (Oct. 28, p. 786.)

Electric Railroad Construction.

ASHCROFT, B. C.—Application will be made at the next session of the Legislature to incorporate a company to build an electric railroad from Quesnelle Fork to Hazeltine; also, to have telephone and telegraph lines in connection, and to generate electric power. Wilson & Senkler are the solicitors for the applicants.

BARABOO, WIS.—The City Council has granted the Baraboo, Kilbourn & Devil's Lake Electric Ry. Co. a franchise to build a line 18 miles long, between Devil's Lake and Kilbourn. The building is to begin in the spring. The incorporators are: J. P. Cottrell of Milwaukee, and H. Grotophorst of Baraboo. (Oct. 7, p. 732.)

CAMDEN, N. J.—At a meeting of the Camden City Council, Nov. 23, Walter N. Boyer, one of the promoters of the proposed elevated electric railroad in Camden, asked that the ordinance for the franchise be withdrawn, owing to the strong opposition to the road. The request was granted. (Nov. 4, p. 805.)

CARROLLTON, KY.—Incorporation papers were filed Nov. 19 by Myron O. Baxter, President; James M. Gaunt, Vice-President; Martin L. Downs, Secretary, and James S. Jett, Treasurer, of a company, to build an electric line from Warsaw to Milton, and from Carrollton to English Station. The capital stock is $50,000. The company will also build a bridge across the Kentucky River at Carrollton. (See Bridge column.)

CHICAGO, ILL.—A permit giving the General Electric Ry. the right to lay a second track in Custom House place, between Taylor and Fourteenth Sts., was granted Nov. 16. The company's ordinance specifies two tracks, and the original permit calls for only one. President Bowen says there is no intention of resuming the building of the line until the dispute with the Chicago, Indianapolis & Louisville has been settled as to the company's right to lay these tracks. (Nov. 25, p. 849.)

At a meeting of the City Council, Nov. 21, the Chicago & Jefferson Urban Transit Co. asked for a 50-year franchise for an extension of its line in Grand Ave., from Armitage to Fullerton Ave., offering only the customary $50 car license as compensation. The ordinance was referred to the Committee on Streets and Alleys West.

CINCINNATI, O.—J. C. Hooven, President of the Hamilton-Corliss Engine Works, Hamilton, O., informs us that he expects to let contracts about the first of January for the building of the Cincinnati, Lawrenceburg & Aurora Electric St. Ry.

DELAWARE, O.—A new company by the name of the Marysville, Pharisburg, Richwood, Magnetic Springs & Delaware Electric Ry. Co. is to build an electric road to connect the towns of these names. W. A. Wright of Maple Dell, Delaware County, is interested in the matter. Engineers will be put in the field to survey the route by Jan. 1.

DOYLESTOWN, PA.—It is reported that the Allentown & Lehigh Traction Co. is considering the advisability of a line from Allentown to Lansdale.

EAST LIVERPOOL, O.—J. L. Francis informs us in reference to the road he is about to build to Lisbon, O., from East Liverpool: The distance is about 20 miles. The line will be standard gage and equipped with heavy electric motors, with power house at West Point, O., where there will be an extensive coal mining industry started up and operated by electricity. The survey of the road is just being completed; bids will be asked for in about 30 days for building and equipping both the mine and railroad.

EVANSVILLE, IND.—It is reported that an electric line from Evansville to Rockport, Tell City and Cannelton is contemplated by capitalists represented by Henning & Henning of Dayton, O. C. J. Murphy, Evansville, may be addressed.

FITCHBURG, MASS.—A franchise has been granted to the Fitchburg & Leominster St. Ry. Co. to double track its Main St. line, and to build in Blossom St. A. H. Moore is Chief Engineer. (Jan. 14, p. 34.)

HAMILTON, ONT.—It is hardly likely that the proposed 15-mile extension of the Hamilton, Grimsby & Bramsville Electric Ry., from Bramsville to St. Catherines & Niagara Central Ry., will be built. The cost of the work is estimated at $107,000. (Sept. 30, p. 715.)

The Hamilton Radical Electric Ry. is building an extension of about one mile from Burlington to Port Nelson. W. L. Degear, of Grimsby, has the contract.

HELENA, MONT.—The Helena Power & Light Co. has asked for a franchise for two additional lines in the city, and for the privilege of hauling building material. One of the proposed lines is to begin at Eighth Ave. and Beattie St., on the present Eighth Ave. line, to run thence south on Beattie St. to Broadway. Another branch is to go through Roberts St., thence to Lyndale Ave. to Fee St. If the franchise is granted, the company will begin building about Mar. 1, 1899.

IRWIN, PA.—The McKeesport & Irwin St. Ry. Co. has petitioned the City Council for a franchise to build through the town. John George C. R. Frichtman and W. W. George of Irwin, are Directors. (Feb. 4, p. 89.)

JACKSON, MISS.—Work is begun on the electric road in which S. T. Carnes of Memphis, Tenn., and the Mayor of Jackson, Mr. Wharton, are interested. The 1.5 miles of horse car tracks are to be done away with. (Sept. 2, p. 629.)

KANSAS CITY, MO.—The Central Electric Ry. Co., which was incorporated last June, is considering an underground electric system in connection with the Northeast Electric Ry. The company has asked for a franchise on Grand Ave., from Minneapolis Ave. to Eleventh St.

It is reported that the Metropolitan St. Ry. Co. is planning an extension of its lines through Summit St., to connect with the Rosedale Ave. line.

LINCOLN, N. J.—It is reported that Silas D. Drake is interested in a project to connect Lincoln and Mizzen Peak, which is on the mountain top, by an electric railway. (Apr. 29, p. 317.)

LOS ANGELES, CAL.—W. S. Hook, General Manager of the Los Angeles Traction Co., has petitioned the City Council to adopt the ordinance and order the necessary advertising for bids for a new line of street railway on Eleventh, Georgia, Sentous and Hoover Sts. The company wants to build an extension.

MILWAUKEE, WIS.—It is reported that the Milwaukee Electric Ry. & Light Co. will build a number of extensions early next year, provided the necessary right of way is given the company free of expense. The extensions contemplated are a line to North Milwaukee, an extension of the Holton street line, an extension of the North avenue line of about a mile, and the extension of the Eighth avenue line to the city limits. The company now operates 175 miles of electric road. To make the extension to North Milwaukee, several bridges will have to be straightened. (Nov. 5, p. 850.)

MONTPELIER, VT.—Reports state that the Hoosac Power & Traction Co. has been incorporated to build an electric railroad in Vermont.

MT. VERNON, N. Y.—The long sought for franchise to build through Sixth St. and several avenues has been granted to the Westchester Electric Ry. Co., controlled by the Union Railway Co. of New York, and work upon the line will be begun at once. (Oct. 21, p. 769.)

NEEDHAM, MASS.—The Needham & Boston St. Ry. Co. has been granted a franchise to lay its tracks through Needham and Bridge Sts., from the Needham town line to the Boston City line at Spring St., West Roxbury. The road is to be four miles long, and it is proposed to begin building this winter. (Sept. 9, p. 657.)

NEW CASTLE, IND.—Elmer J. Binford is reported as representing Greenfield, Ind., capitalists, to secure a franchise for an electric road through Hancock and Marion counties, and eventually to build from Indianapolis to Richmond.

NEW YORK, N. Y.—A number of petitions for railroad extensions were presented to the Council of the Board of Alderman, Nov. 22, by the Third Avenue RR. Co., and the Metropolitan St. Ry. Co. The extensions and connections asked for in the petitions are as follows:

Fort George & Eleventh Avenue RR. Co., Boulevard or Eleventh avenue from Manhattan street to 182d street, also 145th street, from the Boulevard to the Harlem River; New York & Harlem RR. Co., Eighth Avenue RR. Co. and Metropolitan RR. Co., extension on 135th street from Madison to Eighth avenue; Kingsbridge RR. Co., Boulevard from Manhattan street to the junction of Kingsbridge road, 169th street, and Boulevard, Kingsbridge road from 162d street and Amsterdam avenue to Spuyten Duyvil, to 230th street, to Riverdale, to the city line; Third Avenue RR. Co., extension at 155th street to Amsterdam avenue, east over 155th street viaduct to the Macomb's Dam Bridge and across same to Jerome avenue, there to connect with the Union RR. extension at 181st street and Amsterdam avenue, east over Washington Bridge to Jerome avenue, connecting with the Union RR. On the Boulevard, from Manhattan street to 182d street, the cars of both companies are to run over the same tracks, but there are to be different slots through which the power is to be transmitted.

The Fort George Extension Ry. of New York City, the incorporation of which was noted in this column last week, is a consolidation of the North End Street R.R. Co., the Fort George and Eleventh Avenue R.R. Co., and the Fort George Extension Ry Co. The Fort George & Eleventh Avenue R.R. Co. was incorporated last January. (Feb. 4, p. 89; May 28, p. 383; Nov. 25, p. 853.)

OAKLAND, CAL.—An ordinance has been introduced by the City Council, accepting the abandonment and surrender to the city by the Oakland Transit Co. of all its rights and privileges to own and operate a street railway on portions of several streets in Oakland. The tracks are to be removed within 60 days.

OREGON CITY, ORE.—The Oregon City Southern Electric Ry. is the name of the electric road which W. H. Burghardt is building from Oregon City to Wilhoit Springs, about 40 miles. (Sept. 23, p. 697; Nov. 11, p. 821.)

OTTAWA, ONT.—The City Council has taken action to compel the Ottawa Electric Ry. Co. to extend its branch to the exhibition grounds, in accordance with its franchise. An injunction has been applied to restrain the company from operating the railway already built until the branch has been extended. The city claims $10,000 penalty, provided for in a bond between the company and the city, entered into in 1893. The company declares that its failure to extend the branch is that it cannot get permission to cross the Canada Atlantic tracks.

PITTSBURGH, PA.—It is reported that the Monongahela Traction Co. is making an effort to extend its lines to Wilkinsburg, the same territory which the Union Traction Co. is trying to reach. (Apr. 29, p. 317; June 17, p. 445.)

It is reported that the Consolidated Traction Co. is to build several extensions in the Allegheny Valley. Geo. F. Greenwood is General Manager and Chief Engineer.

PITTSTON, PA.—A franchise was recently granted to the Pittston & Scranton Electric Ry., to build a line 2½ miles long, to connect Pittston with Scranton. J. A. Steese, Mount Holly Springs, Pa., is President.

PORT ANGELES, WASH.—Messrs. John Cain and Geo. H. Clementson have asked the City Council for a franchise to build a street railroad through the city.

PORT CHESTER, N. Y.—A franchise has been granted to the Port Chester Electric Ry Co., for its proposed extension from its present terminus in Rye to Mamaroneck. The question of a franchise in Mamaroneck is to be discussed by a public meeting Dec. 7. The Supreme Court has dissolved the injunction preventing the Port Chester Electric Ry. from laying its tracks in Purchase street, Rye.

PORTLAND, ORE.—The ordinance granting a franchise to the City & Suburban St. Ry. Co. for the extension of its lines in the North End, has been vetoed on account of not conforming to the city charter. Application will shortly be renewed by the company.

QUEBEC, QUE.—The Quebec, Montmorency & Charlevoix Ry., to carry out the proposed improvements of electrifying the road and building the branch to Montmorency Falls, and other work, has made application for an issue of $1,500,000 25-year 5 per cent. gold bonds of $1,000 each. The bonds are secured by first mortgage on the plant, and are to mature June 1, 1923, interest payable semi-annually. The authorized stock of the company is $3,000,000, of which $2,000,000 is already issued. The company reserves the right to redeem the bonds on six months' notice at 110 and accrued interest. (Sept. 30, p. 715; Nov. 11, p. 821.)

RISING SUN, IND.—It is reported that Mayor Geo. E. Downey of Aurora, Ind., representing the Cincinnati, Lawrenceburg & Aurora Electric R.R. Co., is making arrangements to extend the line to Rising Sun.

ST. CATHERINES, ONT.—Hon. Charles D. Haines, 100 Broadway, New York, who recently bought the St. Catherines & Niagara Central Ry., says it is to be extended at once to Port Dalhousie at one end, and will have better terminal facilities at Niagara Falls. He also states that considerable trestle work will be done away with at once, at an expenditure of about $60,000. Both steam and electricity will be used. (Sept. 23, p. 697.)

SAN FRANCISCO, CAL.—It is reported that the Market St. RR. Co. contemplates extending its Ellis St. line.

SAN MATEO, CAL.—The Directors of the San Francisco & San Mateo Electric Ry. Co. are considering plans for improving the road. They intend to extend the Thirtieth St. or Cemetery line to Baden. Extensive improvements are also to be made in the power house.

SAUGATUCK, MICH.—Work was begun Nov. 17 on the Saugatuck & Lake Michigan R.R. an electric line to run from Saugatuck to Holland, a distance of 14 miles.

SOUTH BETHLEHEM, PA.—It is reported that capitalists are securing the right of way from South Bethlehem to Nazareth, eight miles, with a view of extending the Eastern Palmer & Bethlehem Electric R.R. to that place. From Nazareth it is proposed to build 12 miles to Wind Gap, Pen Argyl and Bangor, and later to the Delaware Water Gap. (Aug. 19, p. 604; Nov. 18, p. 839.)

SPOKANE, WASH.—The City Park Transit Co. has petitioned the City Council that the grade on Division St. be lowered 4½ per cent.

SPRINGFIELD, MASS.—The Springfield St. Ry. Co. has been granted a franchise to build in West Springfield. The company was recently given authority to issue $300,000 additional stock to make improvements and extensions. J. Olmstead, President, 1 Main St., Springfield. (Apr. 22, p. 301.)

STILLWATER, N. Y.—The Stilwater & Mcehanicville St. Ry. is at work making connection with the Troy City Ry. tracks at Broad and Third streets in Waterford. This work completes the extension from Mechanicville.

SYRACUSE, N. Y.—An objection has been filed by Robert E. Drake, as attorney for the Syracuse Rapid Transit Co., to the proposed removal of the abandoned tracks of the company in Seymour St., from South Geddes to Kellogg Sts. The ground for the protest is that the company had paid for the paving of the railroad strip, and refused to pay for the relaying of it, if it should be torn up.

TORONTO, ONT.—According to reports, the Metropolitan Ry. Co. will shortly build three branch lines. The line from North Toronto to Richmond Hill is now being extended to Newmarket, and a new power house is building at Bond's Lake.

TROY, N. Y.—The Troy City Ry. Co. has petitioned the Common Council for permission to extend its tracks through Hill St., to Vanderburgh Ave. Chas. Cleminshaw is President and General Manager.

UTICA, N. Y.—An injunction has been served on John W. Boyle, President of the Utica Suburban Ry. Co., compelling the company to stop work on its extension between Oriskany and Rome. The franchise to make this extension was granted by the Highway Commissioners of Rome, and now the Common Council of Rome contests the authority of the Commissioners to grant this permission. (Nov. 11, p. 821.)

VANCOUVER, B. C.—Application will be made at the next session of the Canadian Parliament for an act to incorporate a company to build and operate an electric railroad from Stiknee River, in British Columbia, to Teslin Lake, and to Dawson, in the Yukon district. Blake, Lash & Cassels are the solicitors for the applicants.

WASHINGTON, D. C.—The Columbia Ry. Co. has received permission to extend its line from Fifteenth and H. Sts., northeast to the boundary. R. F. Baker, President.

WESTBORO, MASS.—The Westboro, Hopkinton & Milford St. RR. Co., capitalized at $80,000, has made application for a franchise to build in Westboro. Wm. S. Reed of Leominster, Mass., is interested. (Nov. 4, p. 805.)

WHEELING, W. VA.—The application of the Wheeling Ry. Co. for the privilege of extending its tracks on Bridge street was voted down.

WICHITA, KAN.—The Wichita Railway & Illuminating Co. has been incorporated, with a capital stock of $500,000. The following are the Directors: Ernest Rambeck, E. L. Matling, H. G. Landis, W. O. Church and Geo. E. Spalton, all of Wichita.

GENERAL RAILROAD NEWS.

Railroad Earnings.

Showing the gross and net earnings for the periods ending on the dates named:

Sept. 30.		1898.	1897.	Inc. or Dec.
Chicago, Indianapolis & Louisville.				
3 months	Gross	$927,500	$921,942	I. $5,558
3 "	Net	329,772	296,667	I. 33,105

Oct. 31.		1898.	1897.	Inc. or Dec.
Allegheny Valley.				
1 month	Gross	$241,119	$262,494	D. $21,375
1 "	Net	114,846	135,096	D. 20,250
10 months	Gross	2,211,473	2,088,931	I. 122,542
10 "	Net	920,613	877,502	I. 43,111
Atchison, Topeka & Santa Fe.				
1 month	Gross	$3,995,267	$3,695,379	I. $299,888
1 "	Net	1,515,565	1,288,128	I. 227,437
4 months	Gross	13,191,955	12,927,405	I. 264,550
4 "	Net	3,533,982	3,739,345	D. 205,363
Buffalo, Rochester & Pittsburgh.				
1 month	Gross	$349,672	$353,702	D. $4,030
1 "	Net	118,183	134,621	D. 16,438
4 months	Gross	1,375,917	1,290,944	I. 84,973
4 "	Net	485,604	471,008	I. 14,596
Canadian Pacific.				
1 month	Gross	$2,688,730	$2,790,001	D. $101,271
1 "	Net	1,255,845	1,414,738	D. 158,893
10 months	Gross	20,943,363	19,186,341	I. 1,757,022
10 "	Net	8,115,751	8,060,588	I. 55,163
Central of Georgia.				
1 month	Gross	$649,891	$617,787	I. $32,104
1 "	Net	300,427	283,478	I. 16,949
4 months	Gross	1,974,753	1,859,281	I. 115,472
4 "	Net	720,487	676,207	I. 44,280
Central of New Jersey.				
1 month	Gross	$1,245,052	$1,230,733	I. $14,319
1 "	Net	564,182	531,885	I. 32,297
10 months	Gross	10,329,431	10,480,516	D. 151,085
10 "	Net	4,035,830	4,017,250	I. 18,580
Chesapeake & Ohio.				
1 month	Gross	$1,085,494	$1,000,527	I. $84,967
1 "	Net	364,070	322,941	I. 41,129
4 months	Gross	4,107,589	3,902,459	I. 205,130
4 "	Net	1,432,283	1,329,302	I. 102,981
Chicago, Burlington & Quincy.				
1 month	Gross	$4,634,207	$4,357,251	I. $276,956
1 "	Net	2,230,119	2,031,603	I. 198,515
4 months	Gross	15,704,554	15,668,567	I. 35,987
4 "	Net	6,600,054	6,829,357	D. 229,303
Chicago, Milwaukee & St. Paul.				
1 month	Gross	$4,078,456	$3,579,847	I. $498,609
1 "	Net	1,919,974	1,613,298	I. 306,677
4 months	Gross	13,325,621	12,284,752	I. 1,040,869
4 "	Net	5,320,635	4,808,155	I. 512,480
Lehigh Valley.				
1 month	Gross	$2,333,326	$2,343,538	D. $10,212
1 "	Net	951,071	878,670	I. 72,401
11 months	Gross	17,758,230	17,398,420	I. 360,810
11 "	Net	5,076,908	4,295,182	I. 781,726
Lehigh Valley Coal Co.				
1 month	Gross	$2,234,739	$2,536,333	D. $301,594
1 "	Net	*47,410	171,620	D. 219,030
11 months	Gross	14,715,004	15,127,077	D. 412,073
11 "	Net	*972,616	*161,239	I. 811,377
*Net loss.				
Northern Central (Pennsylvania).				
1 month	Gross	$669,906	$645,635	I. $24,271
1 "	Net	242,973	218,701	I. 24,272
10 months	Gross	5,406,870	5,531,076	D. 124,206
10 "	Net	1,509,678	1,699,789	D. 190,111
Northern Pacific.				
1 month	Gross	$3,049,318	$2,784,754	I. $264,563
1 "	Net	1,844,605	1,667,961	I. 176,643
4 months	Gross	9,951,371	8,964,515	I. 986,855
4 "	Net	5,698,621	4,827,549	I. 871,071
Pennsylvania.				
1 mon	Gross	.....	.....	I. $5,000
1 "	Net	.....	.....	I. 68,700
10 months	Gross	.....	.....	I. 1,255,300
10 "	Net	.....	.....	I. 65,500
Pennsylvania Co.				
1 month	Gross	.....	.....	I. $4,300
1 "	Net	.....	.....	I. 121,400
10 months	Gross	.....	.....	I. 2,404,600
10 "	Net	.....	.....	D. 278,900
Philadelphia & Reading.				
1 month	Gross	$2,214,017	$2,184,453	I. $29,564
1 "	Net	1,042,109	1,070,339	D. 28,230
4 months	Gross	7,802,231	8,013,861	D. 211,630
4 "	Net	3,411,672	3,755,122	D. 343,450
Philadelphia & Reading Coal & Iron Co.				
1 month	Gross	$2,342,422	$2,505,170	D. $162,748
1 "	Net	103,106	264,624	D. 161,518
4 months	Gross	7,290,857	9,130,835	D. 1,839,978
4 "	Net	459,248	620 072	D. 160,824
St. Louis & San Francisco.				
1 month	Gross	$711 206	$684,551	I. $26,655
1 "	Net	337,417	328,204	I. 9,213
4 months	Gross	2,438,002	2,453,464	D. 15,462
4 "	Net	1,021,959	1,129,519	D. 107,560
Southern.				
1 month	Gross	$2,259,282	$2,062,870	I. $189,411
1 "	Net	827,240	760,489	I. 66,751
4 months	Gross	8,428,401	7,370,266	I. 1,058,134
4 "	Net	2,750,095	2,324,913	I. 425,181

Sept. 30.			1898.	1897.	Inc. or Dec.	
Union Pacific.						
1	month.....	Gross	$2,069,059	$1,801,791	I.	$267,267
1	"	Net	1,045,194	737,302	I.	307,891
4	months.....	Gross	6,862,319	6,595,787	I.	266,532
4	"	Net	3,218,736	2,408,781	I.	809,955
Wabash.						
1	month.....	Gross	$1,313,135	$1,305,010	I.	$8,125
1	"	Net	393,942	488,797	D.	94,854
4	months.....	Gross	4,964,277	4,694,334	I.	269,943
4	"	Net	1,402,393	1,664,443	D.	262,050

ATLANTIC COAST LINE.—The stockholders of the Richmond & Petersburg, and the Petersburg, two lines of the A. C. L., met at Richmond, Va., Nov. 21, and decided to consolidate under the Atlantic Coast Line Railroad Company of Virginia, a new company authorized by the Virginia Legislature last winter. (March 4, p. 171.)

BALTIMORE & OHIO.—Judges Goff and Morris, in the United States Circuit Court at Baltimore, Nov. 26, signed an order providing for the redemption of the receivership certificates, and the issue of new securities reducing the interest to 3%. The certificates consist of $5,000,000 6% gold certificates, issued in 1896 and 1897, all of which are redeemable, according to the terms of the issue. The receivers give notice, accordingly, to holders of certificates, that they present the same for redemption Dec. 1, at the office of the Mercantile Trust Co., New York, after which date interest on these certificates will cease. (Nov. 25, p. 853.)

The question has been raised as to the legal right of the state of Maryland to turn over its holdings of first preferred stock, $118,100, to the reorganization committee, at the agreed price of $75 per share. Pending decision by the Attorney General, bids have been asked for the sale of the stock.

The reorganization managers of the B. & O. have offered to receive Columbus & Cincinnati Midland first mortgage 4½% bonds at 94 flat for cash. Under the original offer they would have yielded but 75 to 80%. This offer is accepted by the committee and recommended to the bondholders.

BANGOR & AROOSTOOK.—Press reports from Bangor, Me., state that arrangements have been made for funding the bonds of the Bangor & Piscataquis, a leased line of the Bangor & Aroostook. An issue will be made of $1,500,000 5% bonds, to take up $600,000 6%, and $325,000 7% Bangor City loan 30-year $1,000 coupon bonds, due April 1, 1899; also $300,000 Greenville extension, 5% 30-year $500 and $1,000 coupon bonds, due April 2, 1913. By this refunding, the city of Bangor will be relieved of its liabilities. The annual interest on the old bonds is $73,750. The new bonds will require interest payments of $75,000, but will allow an addition of $275,000 for proposed improvements. It is stated that bridges will be improved and heavy steel structures built at Pea Cove; that grades will be changed and much filling and trestle work done at Blanchard.

CAPE FEAR & YADKIN VALLEY.—The foreclosure sale of this property is to take place Dec. 29, at Fayetteville, N. C.. In accordance with the recent decision of the court, it will be sold as a whole and not by sections. (Nov. 18, p. 839.)

CENTRAL PACIFIC.—Holders of the $2,995,000 first mortgage bonds, series A, maturing Dec. 1, are notified that these bonds will not be paid at maturity, but that until readjustment of the company's affairs can be arranged, interest will be paid from Dec. 1, semi-annually, at 5 per cent. per annum. Speyer & Co., New York, give notice to holders of certificates of deposit on these bonds that they are prepared to buy at par and interest at 5 per cent. per annum, from that date, such of the certificates as the holders may desire to sell. It is stated that a plan for the readjustment of the company's affairs, providing for the exchange of New York securities against Speyer & Company's certificates of deposit, will before long be announced. (Nov. 25, p. 854.)

CHICAGO & OHIO RIVER.—This road is to be sold under foreclosure of the first mortgage at Kansas, Ill., Dec. 16. The upset price is $100,000. The line runs from Olney, Ill., to Siddell, 85.42 miles, and was bought by the Peoria, Decatur & Evansville in August, 1893. Recently, however, this sale was declared void. The first mortgage is for $250,000, and the second for $750,000. (May 27, p. 384.)

CINCINNATI, NEW ORLEANS & TEXAS PACIFIC.—A committee, consisting of John W. Warrington, Briggs S. Cunningham and Frank L. Perim, has been appointed by the Doughty over-issue creditors to consider a proposition made to them through a New York broker. This company operates under a lease the Cincinnati Southern, built and owned by the citizens of Cincinnati. (Oct. 28, p. 787.)

COLUMBUS, HOCKING VALLEY & TOLEDO.—Twelve car trust bonds, series A, have been drawn by lot for payment Jan. 1, 1899, at the Atlantic Trust Co., New York, after which date interest thereon will cease.

CUMBERLAND & OHIO.—The Northern Division of this road was offered for sale Nov. 14, but failed to find a purchaser at the upset price of $150,000. The Louisville & Nashville must continue to operate this branch under the 30-year lease made July 28, 1879. (Oct. 21, p. 770.)

DENVER, LEADVILLE & GUNNISON.—(See Union Pacific, Denver & Gulf.)

DETROIT & LIMA NORTHERN.—Representatives of a majority of the holders of the first mortgage bonds of the D. & L. N., and the Lima Northern, have appointed the following committee for the protection of their interests: John E. Borne, President of the Colonial Trust Co.; Jules S. Bache, of J. S. Bache & Co.; Eugene A. Merrill, President Minnesota Loan & Trust Co.; Philip Lehman, of Lehman Bros., and Edward L. Oppenheim, of Oppenheim & Co. Frederick J. Lisman, of 30 Broad street, New York, is Secretary. An agreement has been prepared and lodged with the Colonial Trust Co., under which the bondholders are notified to deposit their bonds on or before Dec. 6, after which the company reserves the right to reject all bonds save under penalty. A majority of the bonds have already been deposited under this agreement.

The receivers have asked authority of the United States Court to expend $500,000 for improvements, including new rolling stock and terminals at Detroit. The Manhattan Trust Co., of New York, has filed exceptions in the Federal Court at Toledo, O., to the report of Special Master Belford in approving payment by the receivers of $78,761 to W. B. Strang, Jr., for material and work on the Columbus & Northwestern extension. (Nov. 18, p. 840.)

FRANKFORT & CINCINNATI.—Amended articles of incorporation were filed in Kentucky Nov. 23 to reduce the capital stock to $40,000. The amount now authorized is $200,000, of which $150,000 is subscribed.

GUNPOWDER VALLEY.—This property was sold at public auction at Towson, Md., Nov. 19, to John Roney, for $2,500. The road runs from the Western Maryland R.R. to Hoffmanville, Md., about three miles, and went into the hands of a receiver Jan. 6, 1894. (Oct. 28, p. 788.)

LITCHFIELD, CARROLLTON & WESTERN.—At the postponed foreclosure sale of this road at Carlinville, Ill., Nov. 26, the property was sold for $85,000 by Master in Chancery, Stuart Brown, to P. M. Johnston, representative of Johnston & Faught of St. Elmo, Ill., well known railroad contractors. At the sale on Nov. 12, no offer was made at the upset price of $140,000. The line runs from Columbiana, Ill., to Burnett, 51.5 miles. A receiver was appointed May 23, 1894. The capital stock is $600,000, and the funded debt $516,000. (Nov. 25, p. 854.)

NEW YORK CENTRAL & HUDSON RIVER.—J. P. Morgan & Co., on Nov. 28, withdrew their offer of July 26 last, to exchange various N. Y. C. & H. R. bonds for new 3½ per cent. gold mortgage bonds of 1997 of the same company. (July 29, p. 556.)

OHIO SOUTHERN.—The Central Trust Co., New York, has appealed against the decision of the lower court authorizing the payment of $757,607 car trust bonds before the road passes from the hands of the receiver. (Nov. 18, p. 840.)

RICHMOND, NICHOLASVILLE, IRVINE & BEATTYVILLE.—Col. Bennett Young, the purchaser of this road at the sale of Oct. 6 last, has filed a bond of $50,000 in connection with his appeal from Judge Barr's order for a resale. This will postpone the sale set for Dec. 3. (Nov. 18, p. 840.)

ST. LOUIS, CAPE GIRARDEAU & FT. SMITH.—The Reorganization Committee, of which Newman Erb is Chairman, has secured the entire issue of $108,500 underlying bonds of the Cape Girardeau Ry., which clears the way for the foreclosure of the Cape Girardeau & Southwestern consolidated mortgage of 1888. The S. L., C. G. & F. S. went into the hands of a receiver March 4, 1893, and succeeded in 1891 to the Cape Girardeau & Southwestern. (Oct. 28, p. 788.)

UNION PACIFIC, DENVER & GULF.—The foreclosure sale of this road on Nov. 19 to the Reorganization Committee was confirmed Nov. 21. It is to be reorganized as the Colorado & Southern, which will issue $21,000,000 of common stock, $8,500,000 4 per cent. first preferred, a like amount of 4 per cent. second preferred, and $20,000,000 30-year 4 per cent. gold bonds. It is to include the Denver, Leadville & Gunnison (Nov. 25, p. 854), which was sold to the bondholders Nov. 18, and the sale of which was confirmed Nov. 21.

A suit has been brought by George N. Miller, of New York, against the Reorganization Committee, to test the validity of the voting trust of the plan of reorganization. The issue is claimed to be excessive of the first and second preferred stock. Holders of trust certificates desiring to participate in this litigation are asked to file their consent with the New York Security & Trust Co.

WISCONSIN CENTRAL.—Permission has been granted for the issue of $1,000,000 in receiver's certificates, recently asked for. The proceeds will be used for new equipment. (Nov. 18, p. 840.)

Electric Railroad News.

BOSTON, MASS.—At the annual meeting of the stockholders of the West End Street Ry. Co., held in Boston, Nov. 22, several amendments to the by-laws were made because of the lease to the Boston Elevated Ry. The following Directors were elected: G. T. W. Braman, Richard M. Saltonstall, Parkman Dexter, Walter S. Swan, Albert C. Houghton, C. Minot Weld, Samuel Little, Stephen M. Weld, Joseph B. Russell, Charles A. Williams, Samuel Spencer, Moses Williams, Alfred Winsor, Messrs. Parkman, Dexter, C. Minot Weld and Charles A. Williams succeed Messrs. T. Jefferson Cooledge, William Hooper and Henry D. Hyde.

CHICAGO, IL.—The Board of Trustees of the town of Cicero, a suburb of Chicago, has instructed its President to notify the Surburban Ry. that unless it restores the through passenger train service between the western limits of Cicero and the several passenger depots of the Chicago Great Western in Chicago, by Dec. 17, the Board will forfeit its franchise. At present this line ends at the western terminus of the Lake Street Elevated at Fifty-second street, and passengers have to pay a second fare in order to reach the Chicago business district.

COLUMBUS, O.—Judge Taft, of the United States Circuit Court, has ordered the sale of the Zanesville Ry. & Electric Co.'s line on Jan. 3, 1899, at the company's office in Zanesville. Wm. Christy, Receiver, has been appointed Special Master to make the sale. Suit was brought by the International Trust Co., of Boston, Mass., on account of default in interest. The road went into the hands of a receiver in January, 1898.

NEW ORLEANS, LA.—The New Orleans Traction Co., Ltd., reports gross earnings for October of $99,519, an increase of $15,630 as compared with the same month of last year, and net $41,518, an increase of $19,417. For the 10 months ended Oct. 31 the gross earnings were $1,098,013, an increase of $57,728 as compared with the corresponding period of last year, and the net $413,956, an increase of $95,444.

ROCHESTER, N. Y.—A mortgage of $125,000 has been taken by the Rochester Trust & Safe Deposit Co. on the property of the Rochester & Irondequoit Ry. Co., which was recently leased for 10 years to the Richester Electric Ry. Co. The mortgage is to secure an issue of bonds dated July 1, 1898, and payable in 20 years.

The earnings of the Rochester Ry. Co. for the quarter ended Sept. 30 were as follows:

Sept. 30:	1897.	1898.
Gross earnings	$203,639	$220,740
Operating expenses	116,692	124,637
Net earnings	86,946	96,103
Other income	2,305	1,693
Gross income.	89,252	97,796
Fixed charges	74,265	75,861

TRENTON, N. J.—Thomas C. Barr of Orange, and Col. A. R. Kuser of Trenton, have purchased the stock and franchise of the Trenton Electric Light & Power Co. The price paid is understood to be $116,000. It is believed that the purchase is part of a plan for consolidating the Electric Light Co. with the Trenton Passenger St. Ry. Co.

WASHINGTON, D. C.—The Belt Ry., a horse railroad of about 15 miles, has been sold to O. T. Crosby for $350,000. The American Security & Trust Co., trustees of the Belt Ry. Co., will shortly make a full report to the court in regard to the sale of the road. It has been in the hands of a receiver since Sept. 20, 1896. (Oct. 14, p. 751.)

At a meeting of the Directors of the Anacostia St. Ry. Co., held Nov. 22, F. C. Stevens was elected President, succeeding H. A. Griswold, heretofore President, General Manager and Purchasing Agent, resigned.

WEST ROXBURY, MASS.—The Massachusetts Railroad Commissioners have authorized an increased issue of $100,000 stock and $50,000 5% 20-year bonds by the West Roxbury & Rosslindale St. Ry. Co. The increased issue is for funding the floating debt for extensions and equipment.

TRAFFIC.

Traffic Notes.

The Southern Pacific announces semi-weekly tourist sleeping cars from Washington, D. C., to San Francisco, by way of New Orleans, and weekly cars from Chicago and Cincinnati, also via New Orleans.

On Wednesday of last week the eastbound Empire State Express left over 50 passengers at Buffalo on account of lack of room. A Buffalo paper says that these passengers could find neither sitting nor standing room.

The Kansas City, Pittsburgh & Gulf announces that it will run trains through Galveston over the Gulf & Interstate road. The last named road terminates at Port Bolivar, from which place it is necessary to take a half hour ferry boat ride to reach Galveston.

A press dispatch from Topeka Nov. 25, states that hundreds of small towns in Kansas are very short of coal, because the railroads are so fully occupied in hauling grain that they cannot attend to the demands of the coal shippers. The railroads are confiscating coal from cars for use in locomotives.

The State Railroad Commissioners of Iowa will hold a hearing at Des Moines Dec. 20, on the application of certain shippers for a reduction of rates on grain and lumber so as to facilitate shipments to and from Southern states over the Port Arthur route. In 1895 the Supreme Court of the state decided that a certain joint rate made by the Commission was unauthorized by the law, but it is said that the Commissioners now expect that, by having a preliminary notice and hearing, they will be able to make joint rates over two or more roads which will be enforceable by law.

Press reports from Montreal state that the rate war between the Canadian Pacific and the Grand Trunk has been settled. All rates were restored Nov. 28. Negotiations are under way with regard to the use of the North Bay line of the Grand Trunk, by the Canadian Pacific, for Ontario business to and from the Northwest, and the service will likely become effective shortly. Freight rates had been severely cut in the provinces of Quebec and Ontario.

Chicago Traffic Matters.

Chicago, Nov. 30, 1898.

There is now a mad scramble for business among the railroads running in every direction from this city. The making of rates is entirely in the hands of the shippers, and they are taking advantage of their privilege to the full limit. Provision rates to the East have become so demoralized that nobody pretends to know within several cents the lowest figures that are being quoted. Some of the local freight officers say that several contracts for big shipments of provisions have been made at 12 cents per 100 lbs. (the printed tariff is 30 cents). Fifteen cents is an every-day quotation. The big meat packers along the Missouri River are also having their own way. The 15-cent rate put in by the Chicago Great Western between the Missouri River and this city has been met by the other lines. From Chicago to the Missouri open cuts of 50 per cent. have been made on the principal commodities. The Chicago, Milwaukee & St. Paul started the ball rolling by meeting the following reductions in its tariff: Cotton piece goods, 21 cents, from 50; crockery, 28, from 65; canned goods, c. l., 15, from 27; dry goods, 34, from 80; flour, c. l., 16½, from 19; hardware, 28, from 65; binding twine, c. l., 15, from 30; glassware, c. l., 14, from 32. From St. Paul and Minnesota, a rate is made on paints in car loads of 20 cents, against the old rate of 32 cents. The lumber rate from the same points is dropped from about 18 cents, to 12.

The long smouldering fire over eastbound passenger differential rates has at last burst into flame. The three standard lines from Chicago have authorized all the Pacific Coast roads to quote the same through rates from the Pacific to the Atlantic via Chicago as are quoted over the differential lines. All of the weak roads, except the Erie, have notified the Pacific Coast roads to change their rates so they will still enjoy the same differential under the standard lines. The standard roads say they are now free to act, and that the differential must go if it takes a ten-year rate war to knock it out.

The Illinois Manufacturers' Association has petitioned the Transcontinental Freight Association for a readjustment of the rates between this district and the Pacific Coast.

Although the New York decision against the constitutionality of the anti-scalping law of that state dampened the spirits of the commercial men of this city who have charge of the present fight against the evil, they do not intend to give up the struggle, but will continue their efforts in behalf of a Federal law. Meetings are now being arranged for in all the larg cities of the Middle West.